IDG .com

CISCO DISCOUNTS A policy change governing discounts on trade-in deals may hike prices on Cisco gear. Page 8.

LINUX FAITHFUL GATHER New opportunities for driving Linux into the enterprise highlight this week's LinuxWorld. Page 10.

The leader in network knowledge

NetworkWorld

August 27, 2001 Volume 18, Number 35

The network portal: www.nwfusion.com



VoIP

NetworkWorld TECHNOLOGY INSIDER VoIP

Session Initiation Protocol is emerging as a key VoIP standard, so we conducted the first public interoperability test of SIP-based vendor equipment. Twelve vendors submitted a total of 18 products, but only four products passed all our tests. Page 46

Interoperability issues and lack of QoS are inhibiting the convergence of voice and data networks, according to our exclusive Miercom survey of nearly 100 VoIP vendors. Page 52

Internal net saboteurs being brought to justice

BY SHARON GAUDIN

An IS worker is scheduled to face federal criminal charges this week in U.S. District Court in Miami for allegedly downloading a virus into his employer's computer system, crashing the network for nearly two full days.

This case, which comes a little more than a year after the first federal criminal prosecution of computer sabotage, is just one in a growing number of insider-based network attacks, according to federal law enforcement agents. Another case is getting ready to go to trial in October in Las Vegas, and yet another was wrapped up with a guilty verdict this summer in New Hampshire.

The U.S. Secret Service, which splits its focus between protecting heads of state and conducting criminal investigations, is handling twice as many cases that involve insider attacks as just a year ago, says

See **Court**, page 75

The high price of computer crime

The Computer Crime and Security Survey* shows that the cost of security breaches is on the rise.



*The study surveyed 538 security administrators from industry, government and academia.

IETF looks to promote firewall/VPN harmony

BY TIM GREENE AND ELLEN MESSMER

One of the annoying aspects of implementing VPNs — getting them to work across corporate firewalls — could be resolved soon based on work by the Internet Engineering Task Force.

During its recent meeting in London, the standards-setting body reviewed a proposed standard for network address translation (NAT) that would spell out how IP Security (IPSec) VPN tunnels should traverse firewalls and other NAT devices.

Ideally, firewalls and VPNs complement each other, with firewalls blocking intrusion from the Internet and VPNs providing a way to extend secure encrypted tunnels across the Internet to connect network devices. But sometimes, firewalls and VPNs don't work well together, especially when different vendors make the VPN equipment.

Take the case of Bell Canada, where employees use the

See **Harmony**, page 14

The flip side of 'What end users hate . . .'

WHAT END USERS LOVE ABOUT YOU

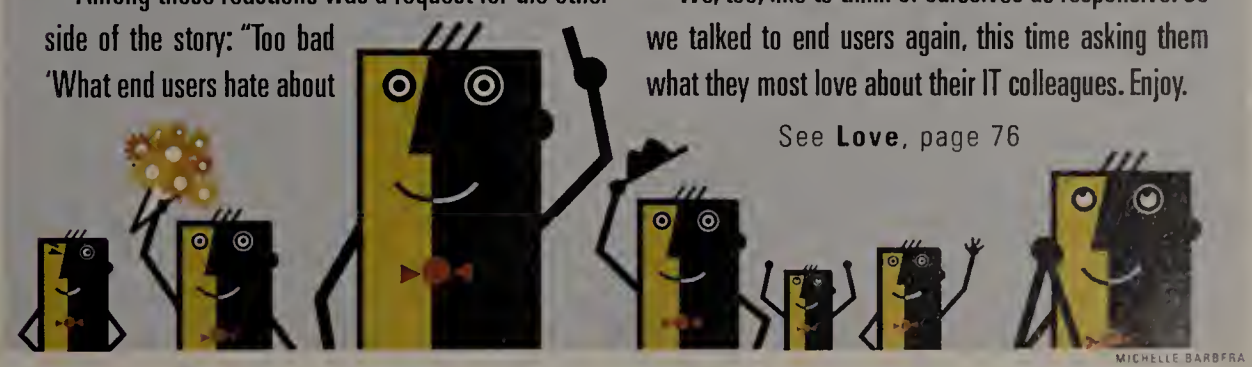
BY JENNIFER MEARS AND KATHLEEN OHLSON

It's been a month since we published a list of the top complaints end users have about IT departments, and your reactions are still pouring in. Seems we touched a nerve.

Among those reactions was a request for the other side of the story: "Too bad 'What end users hate about you' doesn't contain some examples of how good . . . departments do it right," says Phil Roy in a letter to *Network World* (see page 44). "My company's IT group is outstanding and very responsive."

We, too, like to think of ourselves as responsive. So we talked to end users again, this time asking them what they most love about their IT colleagues. Enjoy.

See **Love**, page 76



MICHELLE BARBERA

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Compaq is abandoning their Alpha chip for a new, unproven platform. Don't worry, it's just your business.

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Sun microsystems

NetworkWorld

AUGUST 27, 2001

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10 Linux barreling deeper into the enterprise.

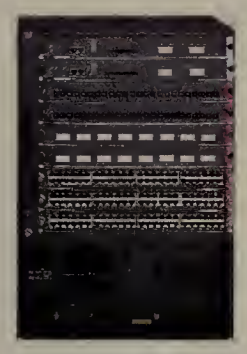
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Cisco's Catalyst 6513 could cost more as a result of changes to a trade-in program.

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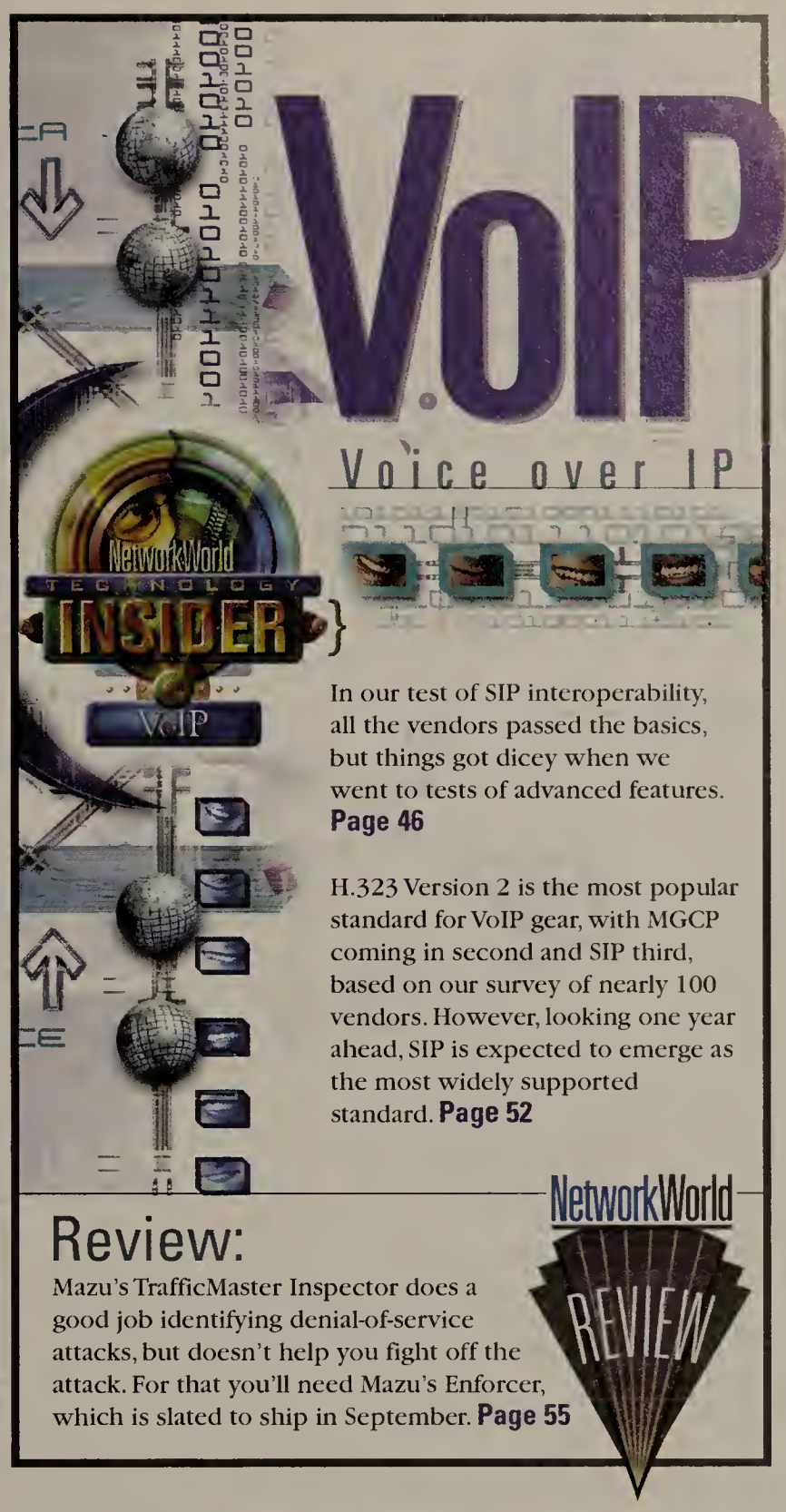
U4EA's FlowFusion helps control packet flow.

Page 16



CEO Jack Messman talks about turning Novell around.

Page 19



In our test of SIP interoperability, all the vendors passed the basics, but things got dicey when we went to tests of advanced features. **Page 46**

H.323 Version 2 is the most popular standard for VoIP gear, with MGCP coming in second and SIP third, based on our survey of nearly 100 vendors. However, looking one year ahead, SIP is expected to emerge as the most widely supported standard. **Page 52**

Review:

NetworkWorld REVIEW

Mazu's TrafficMaster Inspector does a good job identifying denial-of-service attacks, but doesn't help you fight off the attack. For that you'll need Mazu's Enforcer, which is slated to ship in September. **Page 55**

Editorial: Convergence hasn't lived up to the hype. **Page 44.**

Kevin Fong: The data center takes center stage. **Page 45.**

Winn Schwartau: The heck with proprietary encryption algorithms. **Page 45.**

Backspin: PC ignorance — a big mistake. **Page 78.**

'Net Buzz: A frustrating tale of e-window-shopping for a minivan. **Page 78.**

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CIRCULATION: Phone: (508) 490-6444; Fax: (508) 490-6400; E-mail: nwcirc@nww.com; **STAFF:** See the masthead on page 16 for more contact information. **REPRINTS:** (717) 399-1900

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FORUMS

MPLS and IP

A reader needs some advice: Stick with ATM or move to Multi-protocol Label Switching and IP? What do you think? **DocFinder: 5734**

IBM and Linux

Could IBM's Linux efforts increase tension between IBM and the open source community? Read our Aug. 14 story, then discuss. **DocFinder: 5735**

Microsoft offers two new security tools

But Dave P., our forum aficionado, says Microsoft is still years behind everyone else. Do you agree? **DocFinder: 5736**

Relooping computer

A reader has trouble with Windows 2000 continually restarting itself. Any advice? **DocFinder: 5745**

NEWS

Getting broadband abroad

Read about how to get your overseas workers high-speed Internet service. **DocFinder: 5737**

Sigma Networks

The metropolitan network provider is offering a new high-availability wavelength service for its carrier, service provider and large enterprise customers. **DocFinder: 5738**

Marked decline

The second quarter saw sales drop across the board for most networking equipment tailored to service providers. **DocFinder: 5739**

Best Bets

Want to know the most-read articles online? What not to miss? Check out our new Best Bets on NW Fusion. **DocFinder: 5741**

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CARUSO'S CACHE



The best of the NetFlash daily newsletter

Microsoft supporters raised from the dead

Some say Microsoft supporters are stiffs — and in at least a couple of cases, they would be right. Of 400 letters sent to the Utah attorney general asking that the government go easy in its antitrust case against Microsoft, two were signed by dead Utah citizens. But what really bothers me about the news is Microsoft's ungrateful attitude about the whole thing; a spokesman called it "hardly a surprise." Do they think it's easy to return from the dead? To show their support, these people have made the supreme sacrifice, disturbing their Eternal Rest to come back to — of all places — Utah. I think Microsoft owes its users an acknowledgement of such incredible devotion. **DocFinder: 5749**

Experts call MPLS bad for 'Net

It has been more than two weeks since *Network World* ran its story on Multi-protocol Label Switching (MPLS) — and yet many of you continue to read the story online. In fact, it's still one of Fusion's top five. Obviously, MPLS has gained enough of a following at this point that the few negative comments from MPLS experts included in the story have caused quite a stir. Check out the story yourself, if you haven't already, and see what all the fuss is about. **DocFinder: 5750**

Server blades, Itanium at Intel Developer Forum

Network World takes a peek at some of the technologies to be showcased this week at the Intel Developer Forum in San Jose. Hint: Expect news on server blades, those thin servers that allow users to really pack 'em in. **DocFinder: 5751**

Gartner: Don't overspend on application server technology

Looking to save money on IT equipment costs? Start with application servers, Gartner says. Companies have overspent about a billion dollars on such products, which often provide features you don't really need. **DocFinder: 5752**

— Jeff Caruso, managing editor, online news

Sign up for this e-mail newsletter online. DocFinder: 3850

COLUMNISTS



Compendium

Clever hackers

Fusion Executive Editor Adam Gaffin discovers researchers who think it's not all that hard to crack the encryption at the heart of 802.11 wireless networks. **DocFinder: 5742**

Help Desk

Checking cable-modem providers

Help Desk Columnist Ron Nutter advises a reader on how to solve his tricky Web Server problems. **DocFinder: 5743**

View from The Edge

'Father' knows best

Read why one of the "fathers" of the Internet says 'Net traffic is growing faster than ever. **DocFinder: 5744**

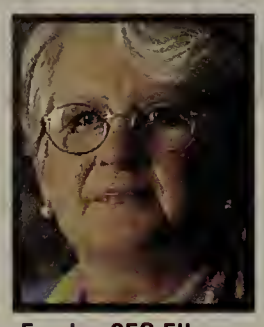
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NEWS BRIEFS, AUGUST 27, 2001

Three directors exit Exodus

Buy-out rumors are swirling around Exodus Communications again, this time after the resignation of three members of the Web hosting firm's board of directors. The once-high-flying company that has been grappling with cash problems announced last week that Mark Dubovoy, managing partner, Leapfrog Ventures; Thadeus J. Mocarski, managing director, Navis Partners; and Naomi Seligman, senior partner, Cassius Advisors, were leaving. The company said they were leaving for personal reasons, although *USA Today* reported that the parting stemmed from a conflict about the company's future. The article also brought up the prospect of a buy-out, with CEO Ellen Hancock quoted as saying, "In today's environment, if a company did come forward with an attractive offer, the burden would be on us and our board to look closely at it."



Exodus CEO Ellen Hancock says the company would "look closely" at an attractive offer.

Survey: AOL least trustworthy on 'Net

As Internet titans Microsoft and AOL Time Warner go head-on in their battle over market share, a report released last week by Gartner indicates that Microsoft has the advantage in at least one key respect: consumer trust. AOL was rated the least-trusted company on the Internet compared with banks, brokerages, large retailers, credit card companies, Amazon.com and Microsoft, according to the survey of online adult consumers. In fact, 37% of respondents gave AOL very poor marks in terms of trust, whereas 29% of those polled said they were distrustful of Microsoft. At the other end, 17% of those surveyed said they have a high level of trust in Microsoft, while 15% said the same of AOL.

Online sales grow despite slow economy

Online sales in the U.S. are continuing to grow, with almost $4 billion of U.S. business conducted on the Web in July, according to research from Forrester Research. Total U.S. online spending increased from $3.2 billion in June to $3.98 billion in July. The number of households shopping online increased to 14.7 million from 13.1 million in June, according to a report from Forrester. The most popular low-priced products are clothes, toys, video games and books, followed by health and beauty products, music and software. More expensive items include airline tickets, hotel reservations, computer hardware and consumer electronics.

Lucent reports progress

Struggling telecommunications equipment manufacturer Lucent is on track to complete the second phase of its restructuring plan and has a new product and organizational strategy to complement that plan, the company said last week. Lucent sees the telecommunications industry reorganizing around fixed-line and wireless service, as well as global markets, and will restructure the company accordingly with three tiers of focus, says Bill O'Shea, executive vice president of corporate strategy and business development. This reorganization will make the company smaller and leaner, he says. Lucent will focus the majority of its business on its top 30 customers, companies in 20 countries worldwide that are responsible for roughly 75% of Lucent's revenue, O'Shea says. The company will put the bulk of its research and development and sales efforts in this area to better serve its top customers.



Lucent executive vice president Bill O'Shea is looking to make the company smaller and leaner.

Microsoft reveals XP pricing

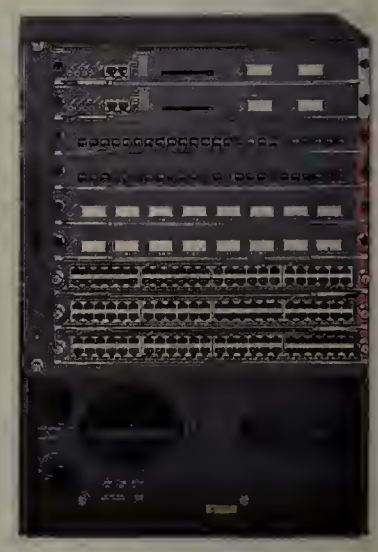
Microsoft last week announced the pricing for its Windows XP operating system. The company will release two versions of Windows XP, one for consumers and one for corporate users, for $199 and $299, respectively. The upgrade version of the Home Edition will cost $99, while the upgrade version of the Professional Edition will cost $199. Windows XP will be launched worldwide Oct. 25, according to Microsoft.

HP has a 'huge bet' on Itanium

A top Hewlett-Packard executive last week signaled his company's commitment to Intel's Itanium processor in perhaps the strongest terms yet, saying the company has laid a "huge bet" on Intel's family of 64-bit chips. "In a very real sense, HP has moved the company behind IA-64," said Richard DeMillo, HP vice president and CTO, in a speech at the HP World conference. "I would hesitate to say we bet the company on it, but if truth be told, we have put a huge bet behind IA-64." HP engineers worked closely with Intel to develop Itanium, which will be offered by a variety of vendors in servers designed to compete with more established — and often more expensive — proprietary Unix systems from the likes of Sun. Itanium systems began rolling out earlier this year, and analysts say they expect demand to pick up gradually during the coming year.

Trade-in program change may hike cost of Cisco gear

BY JIM DUFFY



Users may be paying more for a Catalyst 6513 under Cisco's revamped trade-in program.

SAN JOSE — In a move that could hike prices for customers, Cisco is eliminating a key component of its trade-in program covering competitive equipment.

Cisco last week ended predetermined discounts for resellers under its Competitive Technology Migration Program (CTMP), according to an internal e-mail obtained by *Network World*. Channel partners used the CTMP calculator to predetermine trade-in discounts and would use the precalculated discounts to negotiate sales deals with end users.

Instead, Cisco will review and determine discounts for competitive replacement opportunities on a "case-by-case basis," which means discounts awarded to resellers will fluctuate, as will follow-on prices to enterprise and service provider end users.

The Cisco e-mail also said resellers can no longer offer preset pricing to customers when trading in existing Cisco equipment. All trade-in credits offered on Cisco equipment will require the prior approval of a Cisco sales employee.

"This will allow us to preserve our margin and create better opportunities to sell value into our installed base of accounts," wrote Rick Justice, Cisco senior vice president of World Field Operations, in the e-mail.

Cisco is making the changes because some resellers report-

See **CTMP**, page 76

Cisco restructures around 11 core technologies

BY JIM DUFFY

SAN JOSE — Cisco last week announced a sweeping reorganization that eliminates its line of business structure and replaces it with a centralized engineering and marketing effort around 11 technol ogy groups.

Cisco also shuffled its executive lineup, resurrecting a former enterprise chief to lead development and bidding adieu to the head of its service provider business.

Cisco is eliminating its three lines of businesses — enterprise, service provider and commercial — to focus development and marketing on the 11 technology areas, which include Access, Aggregation, Core Routing, Cisco IOS, Optical, Storage, Voice and Wireless, among others.

"Cisco is evolving its organization to meet the evolving needs of our customers and the market segments we address," says James Richardson, formerly senior vice president of the Cisco's enterprise line of business, who is now Cisco's chief marketing officer. "What we've seen is the requirements for technology are transiting mar-

See **Cisco**, page 10

Correction

In the story "Shopping with peripheral vision" (*Network World*, Aug. 13), a chart listed speeds as byte/sec. The speeds should all be bit/sec.



Qwest TotalCare™ Solutions is available throughout the U.S. Customers in the states of AZ, CO, ID, IA, MN, MT, NE, ND, NM, OR, SD, UT, WA and WY will have their Qwest TotalCare Solutions provided in conjunction with a separate Global Service Provider (GSP) that provides connectivity to the global Internet. ©2001 Qwest Communications International Inc.

Linux barreling deeper into the enterprise

BY DENI CONNOR

SAN FRANCISCO — Linux takes a step deeper into the enterprise this week at the LinuxWorld conference when a slew of vendors trot out new products that are said to be more comprehensive, powerful and fault-tolerant.

Among the show's scheduled announcements:

- IBM will roll out two rugged carrier-grade servers for telephone companies and data centers.
- Hewlett-Packard said it will tout its own version of Linux, suitable for telcos and large enterprise deployment.
- Mission Critical Linux will launch software that can cluster as many as 128 servers for failover.
- BigStorage will announce that its network-attached storage device can perform snapshot backups, failover and replication of data.
- Sistina Software will unveil a new version of its Linux global file system for clustered servers.

While many Linux users say the operating system has been ready for the enterprise for some time, its adoption for critical business applications has been slow. Analysts see that changing.

"Linux is moving more quickly into the mainstream," says Stacy Quandt, an analyst with Giga Information Group. "There's a real focus on Linux clusters and high-availability systems, and storage-area networks."

IBM is pushing Linux into telcos and data centers with the introduction of two new Linux-based servers. Called the xSeries 300 DC and 330 DC, these 1-U (1.75-inch) servers use 48-volt DC power commonly found in larger installations.

"Everything in central offices has always been DC-powered," says Ikhlaq Sidhu, CTO for Cambia Networks, a wireless infrastructure provider in Chicago. "A vendor cannot sell into this environment without DC-powered equipment. It's not just a preferred method; it's required."

Each server ships with the Linux operating system and IBM Director, IBM ServerGuide and Lightpath Diagnostics. IBM Director is systems management software; ServerGuide allows simplified configuration. Lightpath Diagnostics pinpoints hardware problem spots. Available now, the servers start at $1,300.

HP is developing a version of Linux called HP Secure OS Software for Linux, which focuses on enhanced security for telcos and large companies. The company will sell Secure OS for about $3,000 per server.

Mission Critical Linux is bulking up its enterprise characteristics with the introduction of an up to 128-node cluster of computers for telecommunications, financial, scientific or aviation environments, places where downtime is not acceptable.

Each clustered server can be configured to fail over for another server in the event of system failure. Called Convolo NetGuard, the cluster is primed to avoid any latency or network downtime. Interruptions in service when a failure occurs amount to microseconds, the company claims. Convolo NetGuard is managed from a Web-based interface.

To prepare its hardware for enterprise deployment, Linux storage vendor BigStorage is adding fault-tolerant software for disaster recovery to its K2 network-attached storage (NAS) system. The fail-over software, which is $2,000 for two nodes, lets one server fail over to the other in the event of system problems. Pricing for the software that lets data be replicated to another local or remote NAS system is not available.

BigStorage is also offering snapshot back-up capability for $1,000, in which point-in-time copies of data on the disk are taken for disaster recovery purposes. All products will be available in September.

Sistina is previewing its clustered file system for Linux, which lets up to 256 Linux servers share networked storage. Global File System 4.2 includes improved transfer of data over IP-based networks and support for MMAP (memory map), which lets memory from individual servers be combined into a virtual pool and shared.

Also at LinuxWorld:

MandrakeSoft will roll out a version of Mandrake Linux PPC 8.0. It includes updated versions of several popular programs, such as KDE 2.2 and GNOME 1.4, as well as the Linux 2.4 kernel, secure Telnet, support for the Lightweight Directory Access Protocol and Secure Remote Shell capability. PPC 8.0 also supports machines with up to four processors. Available now, Mandrake Linux is $10. ◪

BigStorage's K2 network-attached storage

BigStorage has added data replication, failover and snapshot backups to its storage device.



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Cisco,

continued from page 8

kets. What our [former] organizational structure had done is create a lot of overlap in technology developments."

It also created a lot of success. Under the line of business structure, Cisco grew from $6.4 billion in revenue in fiscal year 1997 to $22.3 billion in fiscal year 2001.

In addition to Richardson's new post — he will continue to report to CEO John Chambers — other executive changes include the return of Mario Mazzola, former senior vice president of Cisco's new business ventures group. Mazzola, who "retired" in mid-2000 as senior vice president of the enterprise line of business and was replaced by Richardson (www.nwfusion.com, DocFinder: 5755), has been named chief development officer, reporting directly to Chambers.

"He never retired," Richardson says. "What he's been doing is leading an incubation effort for us. He and his team were doing this incubation effort called new business ventures. They all stayed as employees of Cisco."

Mazzola will oversee the 11 new technology groups that comprise Cisco's entire engineering organization. Other executive changes include:

- Charlie Giancarlo, formerly senior vice president of the commercial line of business, will run four of the technology groups and report directly to Mazzola.
- Michelangelo Volpi, formerly chief strategy officer, will be in charge of the largest technology area, Internet Switching and Services, reporting to Mazzola.
- Kevin Kennedy, formerly senior vice president of the service provider line of business, will be leaving Cisco to pursue other opportunities.

During his eight years at Cisco, Kennedy has been responsible for leading Cisco's strategy to migrate service provider networks from time-division multiplexing to packet switching. However, his success has been limited: Although Cisco now derives almost half its revenue from service providers, packet telephony has been slow to take hold in service provider networks; Cisco's presence and influence in incumbent local exchange carriers and regional Bell operating companies networks is scant; and Juniper Networks went from 0% to 35% market share in Internet routers in five years at Cisco's expense.

Indeed, Cisco seems to be deemphasizing its service provider operations with this restructuring. In addition to Kennedy's departure, there is not a service provider executive with a direct line report to Chambers within the top ranks at Cisco.

"No matter what Cisco or Chambers says, this move creates the perception that Cisco is not fully committed to becoming a top-three player in communications equipment markets, including optical and 3G wireless, or organized to directly serve and support service providers," says Bill Lesieur, director of Technology Business Research. "There will no longer be one senior executive responsible and accountable for growing the service provider business, which is the most critical component of Cisco's long-term growth strategy."

Referring to Cisco's enterprise-heavy, top management structure, Richardson says: "There's nothing to be read into that. The catalyst of all of this is Kevin [Kennedy] deciding to leave the company. As a result, John [Chambers] took a look at his executive team and said, 'Well, if I'm going to change to a functional organization, I might as well do it now.' We tried to keep Kevin and offer him different positions to keep him interested, but he decided to leave." ◪



Be a
Net Know-It-All

Answer this and nine additional questions online and you could win $500! Visit **Network World Fusion** and enter **2349** in the Search box.

This week's question:

Which U.S. Representative is chief sponsor of a bill called the Internet Freedom and Broadband Deployment Act of 2001?



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IT'S A DIFFERENT KIND OF WORLD.
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Passlogix software to simplify single sign-on setup

BY JOHN FONTANA

NEW YORK — The quest to boil down user passwords to a single secret code for network and application access has always included one condition: IT must set up a dedicated server for the task.

But Passlogix is out to change that. The company last week released the latest version of its V-GO Single Sign On (SSO) software that features integration with directories based on the Lightweight Directory Access Protocol.

The result is that now IT executives can develop a so-called single sign-on capability for their users without having to set up a centralized infrastructure to handle the task.

"The strength of this software is in the client," says Peter Lindstrom, a Hurwitz Group analyst. "And with the addition of the directory it is easier to manage."

V-GO SSO works from a user's desktop by keeping an encrypted file of access credentials for every system available to that user. The software is activated when a user logs on to his or her machine. When that user subsequently tries to log on to a network or application, V-GO SSO intercepts the logon request, grabs the appropriate credentials from its profile store and serves it to the requesting system.

Users need only remember their desktop logon password, a feature that Passlogix says will reduce forgotten passwords and calls to the help desk.

Also, users can store passwords to Web sites and business partner systems that are beyond the corporate firewall, and for applications hosted by a service provider. Those are services can be difficult to duplicate on a centralized system such as those from Computer Associates, IBM, Netegrity, Oblix or Securant.

The architecture also means IT does not have to write scripts or connectors that foster synchronization between a centralized single sign-on server and resources available to a user.

"The primary use here is to help end users better manage their own security, their own passwords and single sign-on," Lindstrom says.

With the addition of directory support, IT can replicate the user profiles to a centralized directory, which lets users roam between laptops and desktops, share machines and work in a disconnected mode. Users can access the directory and cache a copy of their profile on the machine they are using. The profile, tied to the user by a pair of encryption keys, disappears when the user logs off. The directory also can be used to enforce policies such as requiring users to change passwords every 30 days.

Passlogix says V-GO SSO lets IT use stronger desktop authentication, such as smart cards and biometrics. Initially, Passlogix will support iPlanet's Directory Server, but will add support for Novell's eDirectory by October and Microsoft's Active Directory before year-end.

Novell has been reselling the software for the past year and sells it under the name Novell SSO with V-GO.

V-GO SSO 3.0 is available now and costs $70 per user. ◪

AT&T, WorldCom set to support priority data services

BY DENISE PAPPALARDO

AT&T and WorldCom are gearing up to introduce prioritization support for IP-enabled data services that offer more predictable traffic delivery over private WANs.

The carriers are deploying software that supports Differentiated Services (Diff-Serv) on switches throughout their data networks. This updated software will let AT&T IP Enabled Frame and WorldCom Private IP customers establish classes of service over their VPNs that do not traverse the Internet.

Diff-Serv is an Internet Engineering Task Force-proposed standard that defines how to establish various service levels over a network (see related story, right.)

Both companies are using Cisco MGX 8850 switches to support these services. Cisco recently released a new version of its Internetwork Operating System that includes Diff-Serv and other quality-of-service technologies.

The upgrade will let users designate real-time traffic such as voice as first class so that it has priority over other traffic, as well as reserve third-class traffic for standard HTTP Web traffic. While neither provider would detail how many classes of traffic they would offer, it's likely users will have two or three priority levels to choose from.

The IP Enabled Frame and Private IP services that carriers are upgrading already offer frame relay users an IP-like mesh network architecture by using Multi-protocol Label Switching (MPLS) for traffic engineering. These services have been popular with users because they let existing frame relay or ATM customers move from a point-to-point network architecture to a fully meshed architecture without the added costs.

Traditionally, users were required to buy dedicated links to set up a meshed network, but MPLS lets users establish connectionless IP networks over the same frame infrastructure.

As the carriers add new features, more users are likely to jump on board. In fact, an IDC report that will be issued over the next few weeks shows that 60% of 400 WAN managers surveyed say they plan to deploy IP-enabled data services within the next year.

AT&T and WorldCom's IP-enabled services are popular with business users that have legacy networks and want to get more capabilities without jumping to public IP network services, says Steven Harris, an IDC analyst. "Offering users prioritization is a step in the right direction for users, but I don't expect users to demand class-of-service support until they start deploying applications like voice over IP or videoconferencing," he says.

While Diff-Serv will let users better predict how specific applications will be handled over their VPNs, it will also let users ensure any type of business traffic will always takes precedence over e-mail and Web surfing.

AT&T may be more interested in rolling Diff-Serv support so it can offer multinational users a global service offering, says David Rohde, a senior analyst at The Yankee Group. Concert — AT&T and British Telecom's faltering, international joint venture — is offering Diff-Serv support on its IP Select service, which is Concert's equivalent to AT&T's IP Enabled Frame. It has been rumored that AT&T is interested in buying BT's portion of Concert, which is why it would make sense for the company to be prepared with interoperable service options, he says.

WorldCom's Private IP service is available in 40 countries.

Prioritization for IP Enabled Frame is not a new idea to AT&T. Last September AT&T talked about setting up classes of service using IP Precedence, an older IETF specification. But the company has had a change of heart and is now committing to Diff-Serv.

AT&T says it will announce its IP Enabled Frame Diff-Serv prioritization support at NetWorld+Interop 2001 in Atlanta next month. While the company would not offer many details, it did say the service would be available in mid-September and that it does not have plans to charge customers extra fees to use the class-of-service features.

WorldCom says it will announce its service sometime in September. WorldCom's Private IP customers will pay an unspecified "premium" for its enhanced service. ◪



The Scoop — *The news behind the news*

THE SKINNY ON DIFF-SERV

Differentiated Services is a prioritization technology developed within the Internet Engineering Task Force.

The proposed standard lets service providers and users establish classes of service or priority levels over their network. Diff-Serv uses the type-of-service (TOS) bit, which is in the header of every IP packet. Each packet is marked with its appropriate class-of-service tag based on the Diff-Serv parameters.

This lets the routers and switches on the network forward these packets based on the classes that are defined by the carrier and user.

A customer using Diff-Serv will be able to decide how traffic is sent over their private VPN. For instance, a customer could designate all voice and videoconferencing traffic as first class, all PeopleSoft and FTP traffic as second class and all e-mail and HTTP traffic as third class.

The switches on the carrier's network don't look at the traffic as voice packets or e-mail packets, but instead look at the TOS bit to determine which path traffic should be forwarded through. This is what will let the carriers offer end-to-end traffic prioritization.

— Denise Pappalardo



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Nokia boosts security features on VPN software

Company's VPN client and gateway software to support smart cards, certificate authorities.

BY TIM GREENE

MOUNTAIN VIEW, CALIF. — Nokia this week will improve the security features in the software that controls its VPN gear, making it less likely that unauthorized users will break into corporate VPNs protected by the company's equipment.

Version 3.1 of the Nokia client and gateway software supports use of smart cards, which are hardware tokens that provide strong authentication of VPN users. Earlier Nokia security called only for user name and password. The smart card authentication requires users to have the card and to know its password. The new VPN software release supports smart cards made by Setec.

In addition, Nokia is building into these devices support for ensuring that digital certificates used to authorize VPN users are legitimate. The software will support VeriSign's certificate authority only, but Nokia plans to support Entrust and Baltimore Technologies certificate authorities later this fall.

Version 3.1 runs on Nokia's CC500, CC2500, CC5200 and CC5205 VPN gateways, the line of VPN gear Nokia obtained through its purchase of Network Alchemy.

With the software upgrade, Nokia's gateway and PC client software will support a method for making sure VPN traffic can get through firewalls that translate private IP addresses to public ones. This process, called network address translation (NAT), is used to mask private addresses from the Internet or because a corporation lacks enough public IP addresses for all its Internet-connected devices. The Nokia software previously did not support NAT.

Version 3.1 also adds management tools that gather more data about VPN activity, such as which administrators have made configuration changes. These tools also tap data that can be used to warn administrators when the capacity of a gateway is nearing its limit so steps can be taken to add another.

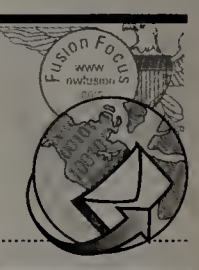
Nokia's gear competes with the likes of Cisco, NetScreen and Alcatel.

The software is expected to ship Sept. 24 with new gear and is a free upgrade to those with a software service contract.

Nokia: www.nokia.com

VPNs

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Harmony,
continued from page 1

Nortel Contivity VPN client on their laptops to remotely establish secure tunnels to a Nortel Contivity VPN switch. When Bill O'Brien, associate director of systems security at the company, decided to add personal firewalls to the laptops to boost security, he tested half a dozen. O'Brien discovered that only one of these products, InfoExpress' CyberArmor, would reliably let Nortel's VPN software establish VPN connections.

"The desktop firewall and the VPN have to work together," O'Brien says. "Hackers are always looking for the weakest links."

In general, much of the problem Nortel and other users have experienced has to do with NAT or related port address translation technology, both of which substitute a private IP address with a public one for Internet traffic. Often, customers give LAN devices private IP numbers because they can't get enough public IP addresses or they want to mask their machines from the Internet. When a NAT firewall or router sends outbound traffic through the firewall, the firewall translates that private address to a public one. It translates in reverse for incoming traffic.

Because IPSec VPN devices create new IP headers for tunneled traffic, packet authentication checks can fail, and tunneled traffic can get dropped by firewalls performing NAT. Individual vendors have found ways to work around this (see graphic), but there is no single agreed-upon method for doing it among vendors. The IETF proposal could become this single method.

The IETF proposal calls for wrapping up the IPSec traffic within a User Datagram Protocol (UDP) header before NAT occurs. Integrity checks on these UDP wrapper headers can be made successfully despite NAT.

This proposal is a combination of suggestions written by several vendors, including Microsoft and RedCreek.

No serious objections were voiced about the draft at the IETF meeting this month, but it has not been elevated to the status of a standard, according to Paul Hoffman, a member of the IETF. Members of the IETF committee handling the proposal are continuing their online discussion of it.

While VPN use is increasing, interoperability among different vendors' equipment is not ubiquitous, and this includes how they deal with NAT problems. And these combined firewall-VPN products are becoming more popular. By 2004, 52% of firewalls will include VPN support, according to market research firm IDC. Last year, 23% of the firewall appliances sold included VPN support, IDC says.

In the meantime, customers have to decide the best course of action based on their current network equipment.

Ken Venner, CIO at chipmaker Broadcom, says his company uses a collection of VPN gear made by Cisco, Nortel and Red Creek as well as a Check Point Software firewall. But Broadcom is dropping the Nortel VPN because it doesn't handle NAT well with the Check Point firewall. "If there were an adopted standard, I probably would have had only one software VPN product and one or two hardware-based VPN products," Venner says.

As you might expect, vendors that have worked out their own answers to the NAT problem and sell integrated VPNs and firewalls say their gear is the best way to go. Check Point chairman Gil Shwed claims that buying the VPN and firewall separately is too costly and expensive.

"You need to manage two policies, two sets of systems and that's simply too expensive, not only in the fact that you have to purchase two boxes, which obviously costs more than purchasing one, but also in managing on a day-to-day basis," Shwed says.

But separating the VPN and firewall allows for more flexible configurations. Richard Palmer, vice president of VPN and security at Cisco, cautions there is no one-size-fits-all answer. But in Cisco's experience, larger companies buy the VPN and firewall separately because that configuration allows building larger networks.

"Most large enterprise customers typically do not use a VPN/firewall combination," Palmer says. A typical configuration, according to Cisco, involves running the VPN gateway and firewall in parallel, with the corporate router directing IPSec packets to the VPN gateway and non-IPSec traffic to the firewall. That way, the VPN traffic doesn't actually pass through the firewall because the VPN tunneling is considered to provide an appropriate security level.

Despite the fact VPN vendors implement the IPSec VPN standard differently and that firewalls handle security in a number of ways, combining firewalls from one maker with VPN gear from another is still possible.

Some vendors and service providers take on the integration work themselves, making it easier for end users to implement the products. Cisco, for example, doesn't offer a desktop firewall of its own, "so we do a lot of interoperability testing ourselves with personal firewall systems that our customers ask us to check out," Palmer says.

Internet service providers, including WorldCom, are also documenting how to successfully piece together firewalls and VPNs. "We have a number of standard configurations and have our engineers certify the configurations," says Audrey Wells, senior manager of IP VPN services for WorldCom. These certified configurations are then used in customer networks, she says.

But once a standard is in place and widely adopted, users won't have to worry about NAT anymore says Chris Welles, a development manager with VPN equipment maker SafeNet. "Ideally you want something that you can just put in, and it works without having to configure anything," Welles says. ◪

Location, location, location

Where VPN gear and firewalls are placed can affect how well they work together and overall security. Configuration can also be affected by network address translation (NAT).

Configuration	Pros	Cons
VPN behind firewall	Firewall security is applied to VPN traffic	NAT can invalidate VPN traffic
VPN in parallel with firewall	Allows free flow of NAT addresses	VPN traffic is not firewalled
Firewall behind VPN	Allows free flow of NAT addresses	VPN gear is exposed to the Internet
VPN behind firewall with UDP encapsulation	Allows free flow of NAT addresses	Can compromise authentication header

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U4EA to launch bandwidth mgmt. software

Start-up's FlowFusion device will compete with Packeteer and Sitara Networks products.

BY APRIL JACOBS

LONDON — Start-up U4EA next week will unwrap its FlowFusion bandwidth management technology, which the company says will not only let network managers provision application bandwidth, but also help them predict how applications will behave with network policies they put in place.

FlowFusion, a turnkey hardware/software device, is designed to do more than just allot bandwidth to packets going over a network. Using the tools in FlowFusion, network managers can model how, for example, a videostream will perform with the bandwidth provided for it. Voice and video packets are particularly sensitive to loss and delay, and FlowFusion's predictive capabilities can help network managers avoid those situations by letting them replicate and analyze traffic prior to implementing network policies, U4EA says.

Francis Yiu, president of Novani, a collocation systems integration company in San Francisco, says FlowFusion technology could help his customers save bandwidth. "Companies that have performance problems tend to throw more bandwidth — open up the pipes — to solve issues," Yiu says. "This product can help them identify at a more granular level what is happening," so applications and bandwidth can be managed more efficiently.

Columb Harrington, CEO of U4EA, says the company's software is based on technology developed with partners including CERN, the European Center for Nuclear Research, which needed the technology to help predict and control high-speed networks.



U4EA's FlowFusion device will let users control packet flow between local- and wide-area networks.

The FlowFusion device sits between a customer's LAN-WAN interconnect, typically behind a switch or router. The device will feature dual 10/100M bit/sec Ethernet ports, and users will be able to configure the box with a Java-based graphical user interface. The management software also includes a command line interface that lets it be accessed through telnet, or directly through a console cable.

U4EA will compete with bandwidth management vendors such as Packeteer and Sitara Networks. A venture capital-funded start-up, with about $10 million in recently secured funding, U4EA has investments from IIU Limited, the investment arm of Dermot Desmond, AIM Trust, and Henderson Technology. The company is launching in the U.S. with an office in Salt Lake City.

U4EA isn't naming any big customers yet.

Co-founder and COO Ian Parker was vice president of operations at BATM Advanced Communications, a broadband data and telecommunications company, prior to joining U4EA. Peter Thompson, vice president of software development at U4EA, served as a senior research fellow at the Science Research Foundation in Bristol, England.

Prices for FlowFusion will start at $12,000.

U4EA: www.u4eagroup.com

Novell packages opens directory access, eases administration

BY JOHN FONTANA

Novell this week will release an updated PeopleSoft driver for DirXML, a move that shows the company's intention to link the metadirectory with its new employee provisioning software.

The provisioning software will make it easier for IT professionals to provide new employees with equipment and access to applications when they join a company

Novell also plans to ship DirXML 1.1 next month with new drivers that support NT domains and delimited text files. Both drivers, which connect the metadirectory to other systems, will be added to the base set of drivers that ship with DirXML.

A metadirectory is designed to "join" together user data from myriad directories that typically populate a corporate network.

Version 1.1 of DirXML also will include new administrative features that support load balancing, error detection and enhancements to the rules engine.

The additions to DirXML are designed to give customers a wider array of systems that connect to the metadirectory, which is built using Novell's eDirectory, and new ways to manage those connections.

But they also are being used to link key technologies that Novell is hoping will help restore the company's vitality.

"There are no breakthrough advances with the new driver, but Novell is using it to nudge into the provisioning market and to raise the volume level on DirXML," says John Enck, a Gartner analyst.

Indeed, Novell executives say the PeopleSoft driver, which features support for Version 8.1 of that software, is a key component in Novell's Employee Provisioning System, which allocates access rights to users. Novell introduced the provisioning software last week.

The key is that PeopleSoft 8.1 introduced support for XML, and Novell intends to use XML, to let all sorts of data be swapped between DirXML and PeopleSoft. The new driver will provide the connection for automatically creating PeopleSoft accounts and passwords.

Novell is working on drivers for other popular enterprise resource planning (ERP) applications, but officials would not say which ones. SAP, Oracle and J.D. Edwards all develop ERP applications.

Novell, which is focusing on XML to build connectors, is trying to distinguish itself from vendors such as Critical Path, iPlanet, Microsoft and Siemens that mainly rely on Lightweight Directory Access Protocol for their metadirectory connectors.

The release of the PeopleSoft driver will be followed by DirXML 1.1 next month. One key feature is the ability to deploy drivers on platforms separate from those that run the DirXML engine and eDirectory.

"The real jewel of this feature is that it extends the cross-platform support of the drivers beyond the platforms that eDirectory supports," says Wendy Steinle, DirXML product marketing manager. The drivers, which are built using Java or C++, run on NetWare, Windows 2000 and NT, Sun Solaris, Linux and Tru64 Unix.

The PeopleSoft driver is priced at $10 per user object. DirXML 1.1 costs $29. ◪

See related story, Page 20.

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Briefs

TamoSoft introduced last week a network traffic analyzer for Windows NT and 2000 server-based networks that lets network professionals isolate security flaws, network bottlenecks and other network problems. CommView 3.0 can decode more than 20 protocols. It is compatible with wireless Ethernet adapters and has new filters that let customers view network sessions, IP addresses, ports and individual packets of data. CommView can generate reports in plain text or HTML formats, and can export packet information to other protocol analyzers. The product starts at $100 and is available now.

TamoSoft: www.tamos.com/products/commview

EMC has announced that it has tripled the distance data can travel over Fibre Channel or Enterprise Systems Connection, letting system administrators bridge storage-area networks over greater distances. The company's **Symmetrix Remote Data Facility** (SRDF) will now support distances of more than 125 miles between servers and its storage arrays. SRDF is remote mirroring and disaster recovery software. SRDF starts at $22,500.

EMC: www.emc.com

Storage vendor **Crossroads Systems** recently improved its Fibre Channel to SCSI router. The **Crossroads 8000 Storage Router** now has two Fibre Channel and eight SCSI Ultra/160 ports for connection to SCSI-based hosts and Fibre Channel storage arrays. It also contains dual power supplies and fans, as well as a 10/100 M bit/sec Ethernet port and a serial port for remote management. The Crossroads 8000 costs $19,000 and is available now.

Crossroads: www.crossroads.com

TAKING TIME WITH JACK MESSMAN

CEO examines state of Novell

Newly appointed Novell CEO Jack Messman last week fielded a variety of questions, posed by Novell customers, on how intends to turn the company around. Network World *Senior Editor Deni Connor obtained and read the customer queries.*

What's your plan for turning Novell into a growth company and what products are key to doing that?

Obviously the focus on solutions is primary for growth. This focus will drag a lot of Novell products along, so to speak. The second thing is Novell has not been a company that has been known for its focus on customer needs. We invented cool products that may or may not have had a market. With the solutions focus, we are going to get better feedback from our clients and customers as to what the problems are, so we can develop products that solve those problems. We have a task force in the company on formalizing that focus. We also need to do a better job of articulating where we are and how we are different. We did brand advertising, but now we need to connect the brand to the products.

It seems the future of Novell hinges on providing consulting and services to enterprise customers. What are you doing for those small and midsize customers that need the same business solutions but can't afford consulting projects?

This is all about choice, and it is wrapped up in our channel. Many customers want to deal with a local solutions provider. They see him at the country club; they see him at church. Others, particularly large, complex accounts require direct interaction with Novell. That's why we developed our direct salesforce. The channel is still hugely important to Novell because we can't cover the entire market by ourselves. We need to provide them with what they need to be successful as a partner. We need to improve our relationships with them. We have not done a good job of that. We have had conflicts in the field that need to be resolved.



We do have a NetWare for Small Business product that is going to be upgraded for NetWare 6 when it comes out in September. We are going to support the channel to go after smaller accounts.

In NetWare, you don't see per-seat licensing until you get to really large installations. When will we see per-seat licensing for smaller and midsize businesses?

NetWare 6 will be user-based licensing. It's not so much what the pricing is; it's what the total cost of ownership is. You wouldn't buy a car just because it was low priced if the cost of maintenance and running it was very high. Gartner did a study concluding that we have the lowest cost of ownership for any operating system vendor.

What is Novell doing with customers that are not happy with the products and attention Novell gives them?

We have some competitors that have taken products that are less than world-class and integrated them tightly into suites of products and have been able to get good customer acceptance.

The quality of our products is good. Novell has been guilty in the past of taking these products in a big box and dropping them at the feet of our customers and saying 'These are really great gee-whiz products but have fun putting them together.' We have to take these products, make them part of a suite that works effectively together and is part of a solu-

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CHATTING UP NOVELL

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Ecutel supports wireless roaming

BY TIM GREENE

ALEXANDRIA, VA. — At Networld+ Interop next month, Ecutel will announce a deal to license its wireless-roaming and security software to a Japanese maker of VPN equipment that will let wireless laptop users roam among wired and wireless networks without losing secure sessions.

Matsushita Electric Industrial, the parent of Panasonic, plans to use Ecutel's Viatores software as part of Matsuchita's VPN products, for now only available in Asia. Ecutel's products are available in the U.S.

Viatores addresses seamless 802.11b roaming issues that are considered important by the Wireless Ethernet Compatibility Alliance (WECA). Those issues include the ability to secure wireless sessions. WECA includes equipment makers Agere Systems, Dell, Enterasys and Nokia.

Viatores consists of software installed on mobile Windows 98 or 2000 PCs and a Viatores Server, which can be supported by Windows NT/2000 or Linux. Depending on the network configuration, users might also need a Viatores Gateway, a Viatores Relay and a Viatores Multiplexer.

For security, the Viatores Server authenticates users of the PCs with the Viatores Client then encrypts and manages traffic between the LAN and the PCs to establish an IP Security tunnel. As PCs move from a wired LAN connection to a wireless LAN link, the server detects this. The server automatically locates the wireless access point the PC is using and the PC's new IP address, and keeps traffic flowing. This transition takes milliseconds and doesn't disrupt client-server sessions, says John Harrison, CEO and founder of Ecutel.

"Ecutel's strong point is they are integrating their own security. Others are going to third parties for security and layering it on their wireless technology," says Tim Scannell, an analyst with Mobile Insights.

For instance, Nortel is bundling Certicom VPN software for wireless PDAs with

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Wired Windows . Dave Kearns

ATTITUDE PROBLEMS ABOUND AT MICROSOFT

"It appears that Microsoft has misconstrued our opinion, particularly with respect to what would have been required to justify vacating the district court's findings of fact and conclusions of law..."

— U.S. Court of Appeals for the District of Columbia

Once again, Microsoft has managed to antagonize a federal court, but this time it's not a single judge — such as the District Court's Judge Thomas Penfield Jackson — but an appeals court of seven judges!

Last December, I criticized Microsoft's handling of the appeal as being both too broad and too scathing in its castigation of Jackson (www.nwfusion.com, DocFinder: 5725). The Court of Appeals, in general, agreed with me. Its ruling was that Jackson's findings of law and fact — the objective part of a trial — were right on, but that his out-of-court activities could be seen as affecting the penalty phase — the subjective part of the trial.

Its also interesting that Microsoft has now appealed to the U.S. Supreme Court — the same court that Bill Gates' lawyers said could benefit from the oral arguments at the Court of Appeals level. When I read that, I took it to mean that the Supreme Court wasn't capable of understanding the issues on their own (well, that certainly fits in with the "let's insult the intelligence of all the judges" tactic!). But evidently, at least according to the appeals court, it's Microsoft that doesn't understand.

The language of the appeals court ruling is somewhat sharp, indicating to me that the judges feel Microsoft is overstepping the bounds of good taste and jurisprudence. Jackson felt that way, and Microsoft used it as the basis of this appeal.

To recap: Microsoft managed to lie to Jackson while attempting to hoodwink him, then used his subsequent anger as a cudgel to have his penalty overturned. They next said the Supreme Court was too dumb to understand the technology involved. They've now managed to anger the Court of Appeals with their stalling tactics. Evidently years of Panglossian chanting to consumers that Windows was "the best of all possible operating systems" has let the Redmond brain trust to the false realization that everything is a marketing problem, solved by jumping up and down, yelling and screaming, and hiding the facts.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of The Week



Microsoft manages to stay on top in networking in large part due to Novell's fiascoes — such as the problems with the latest NetWare 5 service pack (www.nwfusion.com, DocFinder: 5726) and the GroupWise Padlock patch (DocFinder: 5727).

Novell,
continued from page 19

tion to a business problem.

How do Novell and Cambridge Technology Partners expect to reach network managers and CxOs who have no exposure to Novell or NetWare?

Most consulting firms, if not all of them, develop solutions by customer engagements. We solve a customer problem with a solution. Our employees are required to put that engagement and how we solved the problem on our knowledge management system. Management regularly reviews that to see if it is a solution that should be more widely available or that other customers have a need for. If so, we then take that solution and bring it back to headquarters and involve the people who originally worked on the solution. They develop a methodology that can be provided to other customers. If we can develop a tightly integrated suite of products and services, it can then be sold by the Novell sales force. We are going to train the Novell sales force to be more solutions-oriented.

Users say Novell should fight back when Microsoft slams its products. Why does Novell just sit back and take it?

When you see Microsoft's marketing muscle and the balance sheet — $30 billion plus in cash — it's not a wise business strategy to take on the giant. We need to find places where that's not the issue. Microsoft is not going to stop taking shots at us, but those people who understand our products know that they are very good, otherwise we would have been out of business a long time ago. Many of our products are just becoming relevant to what is happening in the marketplace. ◪

Ecutel,
continued from page 19

Nortel Contivity VPN switches.

Scannell says because wireless data is inherently susceptible to interception, it is essential to authenticate users and encrypt data. Traditional Internet security technology such as Secure Sockets Layer is viewed as not secure enough for critical business data. "That just doesn't fly in the enterprise," Scannell says.

Separate software called Viatores Relay can be placed in a company or in a wireless Internet café to seek out new devices coming into its range. This device makes the transition between access points smoother and faster than if Viatores Clients had to announce themselves.

Viatores Gateways come into play when a PC accesses the Viatores Server a firewall. The PC authenticates to the gateway, which in turn forwards traffic through the firewall to the Viatores Server.

Viatores Multiplexers are placed at the same site with Viatores Servers to send tunneled traffic as HTTP so it can traverse firewalls protecting other companies. This is used when laptop users visit a site owned by a business partner and want to use the partner's Internet connection to set up a Viatores VPN link to reach their home network.

Because the partner's firewall will not challenge HTTP traffic, the partner's IT staff doesn't have to make special accommodations for the visitors.

Viatores equipment is available now. A server, relay and gateway package costs $10,000. Extra servers, relays and gateways cost $2,000 each. Clients are sold in blocks that cost $75 to $110, depending on how many are bought. Harrison says the total cost comes to about $150 to $200 per PC, depending on the size of the network.

Ecutel: www.ecutel.com

NOVELL LAUNCHES PROVISIONING SOFTWARE

Novell last week launched a software and consulting service that will make it easier for IT professionals to provide new employees with equipment and access to applications when they join a company.

The Novell Employee Provisioning package, is Novell's first bundling of Novell products with consulting and implementation services known as a Jumpstart. This Jumpstart package "allows new hires to be productive very quickly, quicker than most administrative processes allow today and allow administrative costs in managing people to be significantly reduced," says Jack Messman, Novell CEO.

The Employee Provisioning Jumpstart will be sold by Novell and Cambridge Technology Partners consultants and Novell's direct sales force to enterprise users who have the PeopleSoft human relations database product.

The Jumpstart would reside on server with eDirectory and DirXML installed that acts as a hub through which application data passes.

When a new employee enters the company, his or her information is entered into the PeopleSoft system. From there, with eProvisioning, information on the employee will be distributed to other parts of the network and applications, where it may be used to get a user a cell phone, pager or PC, or give them access to applications they may need.

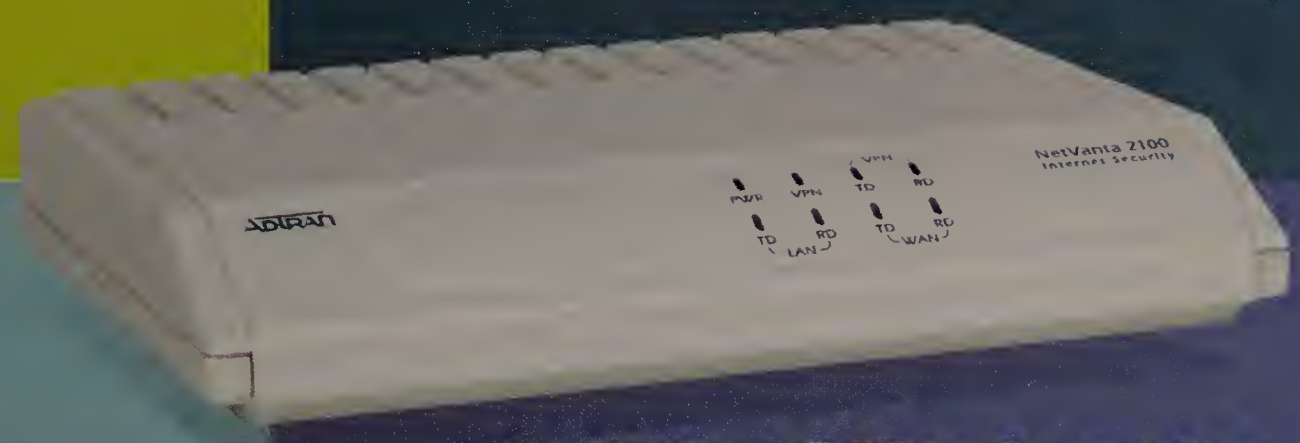
Employee Provisioning uses the Lightweight Directory Access Protocol (LDAP) directories of applications to pull data from or place data in the application, and uses Employee Provisioning uses Novell's eDirectory technology, its metadirectory DirXML, the PeopleSoft application and custom software drivers to provide the links among a customer's applications.

The Novell Employee Provisioning Jumpstart is available now.

— *Deni Connor*



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Ultrafast wireless technology set to lift off

BY JOHN COX

HIGH-SPEED WIRELESS

Ultra-wideband systems could be faster and less expensive than current wireless LAN systems.

Later this year, the Federal Communications Commission will decide whether to give the green light to so-called ultra-wideband transmission. If approved, UWB could have a dramatic impact on short-range wireless communications for the enterprise.

UWB is almost two decades old, but is used mainly in limited radar or position-location devices. Only recently has UWB been applied to business communications. It's a different type of transmission that will lead, proponents say, to low-power, high-bandwidth and relatively simple radios for local- and personal-area network interface cards and access points. At higher power levels in the future, UWB systems could span several miles or more.

Wireless technologies such as 802.11b and short-range Bluetooth radios eventually could be replaced by UWB products that would have a throughput capacity 1,000 times greater than 802.11b (11M bit/sec). Those numbers mean UWB systems have the potential to support many more users, at much higher speeds and lower costs, than current wireless LAN systems.

There is a range of UWB vendors — not to mention academic researchers, the military, defense contractors and many others — looking to unleash UWB products. Among the best-known UWB vendors are Aether Wire and Location, Multi Spectral Solutions, Pulse-Link, Time Domain and Xtreme Spectrum. Intel has a laboratory focused on UWB research. The Ultra Wideband Working Group, a UWB advocacy organization, lists about 150 organizational members from around the world, including Compaq, Daimler Chrysler, Intersil, Lockheed Martin, Motorola and the U.S. Air Force.

"Ultra-wideband is in its infancy in terms of speed and distance," says Frank Dzubeck, president of Communications Network Architects, a Washington, D.C., consulting company, and a *Network World* columnist. "The initial approval from the FCC might be, for example, for 100M bit/sec with a range of 150 feet. But there's no reason why you can't increase speed and distance. It's a matter of power and finer and finer granularity of the silicon chips."

UWB is fundamentally different from existing radio frequency technology. For radios today, picture a guy watering his lawn with a garden hose and moving the hose up and down in a smooth vertical motion. You can see a continuous stream of water in an undulating wave. Nearly all radios, cell phones, wireless LANs and so on are like that: a continuous signal that's overlaid with information by using one of several modulation techniques.

Now picture the same guy watering his lawn with a swiveling sprinkler that shoots many, fast, short pulses of water. That's typically what UWB is like: millions of very short, very fast, precisely timed bursts or pulses of energy, measured in nanoseconds and covering a very wide area. By varying the pulse timing according to a complex code, a pulse can represent either a zero or a one: the basis of digital communications. UWB energy pulses operate in the same frequency spectrum as electronic "noise" emitted by Pentium II chips, TV monitors, electric razors, automobile ignitions and fans. This is a huge swath of the spectrum, regulated only by FCC rules on how much power these devices can use.

This difference in transmission methods has several big implications.

For one thing, because UWB pulses don't actually use a traditional radio signal, called a carrier, UWB transmissions don't take up any of the radio spectrum. Spectrum is limited, and demand for it is growing fast. That's one reason for the FCC interest: UWB would allow a whole new class, and volume, of voice and data communications that, in effect, wouldn't take up any more "space" in the crowded radio spectrum.

Second, and partly as a result of the fact that UWB doesn't use a traditional radio signal, UWB transmitters and receivers will be much simpler to build, run and maintain than those in use today, says Douglas Cummings, an engineering scientist at the Applied Research Laboratories at the University of Texas at Austin. "For UWB, you don't need complex radio frequency converters and modulators and so on," he says. "I only need a digital method to construct the pulses and modulate them. This can all go on a single chip. One vendor already does this on a chip the size of a penny."

Third, because UWB operates in the electronic "noise" area of the spectrum, it requires little power. "These systems can use 50 to 70 milliwatts of power," says Adrian Jennings, technologist with Time Domain in Huntsville, Ala., one of the pioneer vendors in UWB. "That is one ten-thousandth the power of a cell phone." The low power limits the range, but there are features of pulse transmission and some tuning techniques that can, in effect, extend or maintain the range.

In addition, low power and the characteristic wide spread of the pulses means the pulses don't use up already crowded chunks of the radio spectrum, today occupied by 802.11b wireless LANs and Bluetooth devices.

Despite the low power, UWB also has greater capacity — higher bandwidth for more users — compared with these other technologies. In early August, Time Domain began testing its just-fabricated, second-generation UWB chipset using silicon germanium technology created by IBM. The new chipset can reach 40M bit/sec, compared with just 2.5M bit/sec for the first chipset two years ago, Jennings says. Another start-up, Fantasma Networks, which Pulse-Link acquired in May, claims to have reached 60M bit/sec.

Finally, UWB promises to be highly secure. It's very difficult to filter a pulse signal out of the flood of background electronic noise, and vendors such as Time Domain are encrypting the zeros and ones being transmitted by the pulses.

But legalizing UWB, so vendors could start building network products with UWB chips, is up in the air. FCC's public comments on UWB have been generally favorable, and academics and a wide range of vendors, including Intel, are pressing for approval. But there is concern that UWB transmissions, especially for UWB devices that will operate below about 2 GHz, will interfere with other broadcasts. These include the Global Positioning System (GPS), public safety nets, air traffic, marine navigation and communications, AM and FM radio, and television broadcasts, to name just a few.

The University of Texas ran a battery of tests last December looking at the UWB's impact on GPS. The data were handed over to the FCC last February with several other independent studies. UWB can have an effect, but whether it is unacceptable depends on how one defines it, Cummings says. The tests also found the effects vary widely depending on how the UWB transmitter is tuned, timed and powered.

"There are substantial disagreements [among the interested parties], especially over what are the adequate margins for protecting these bands against interference," says Julius Knapp, deputy chief of the FCC's Office of Equipment and Technology. "FCC Chairman [Michael] Powell has said to Congress that we'll address the issue before the end of this year."

Cummings says he is confident approval will be forthcoming. "There's just too much potential in this for someone to say, 'No, we're never going to use this,'" he says. ◪

Ultra-wideband: New way for wireless

Traditional radio waves . . .

- Travel on specific frequencies.
- Crowd the radio spectrum.
- Bounce off objects, causing signal fade.

Ultra-wideband pulses . . .

- Span a wide swath of spectrum (no crowding).
- Need little power.
- Capacity to transmit more than a thousand times as much data as current 802.11b wireless LANs.

"Did you back up all my files?"

Translation: I think I just deleted all my files.



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B801

1. What is the principal business activity at your location?

(check ONE only)

01. ☐ Manufacturing (Non-Computer/ Communications/OEM)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/ Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities/Process Industries (Mining/Construction/ Petroleum Refining/ Agriculture/Forestry)
10. ☐ Government/Military
11. ☐ Consulting (Independent) *
12. ☐ Education
13. ☐ Carriers/Voice/Data/ISP
14. ☐ Web Hosting/HSP
15. ☐ ASP/SSP/MSP
16. ☐ Manufacturing (Computer/ Communications/OEM)
17. ☐ Resellers/VARs/VADs/ Integrators/Distributors* (Computers/Communications)
18. ☐ Other (please specify)

_____

*Attn Consultants, Integrators, Distributors, Resellers: Please complete form based on ALL clients and your own business needs

2. P: What is your primary job function? (check ONE only) S: What additional job functions are you involved in? (check ALL that apply)

P	S		P	S		P	S	
☐	☐	1. Network Management	☐	☐	4. Datacom/Telecom Management	☐	☐	7. Corporate Management (CEO, COO, CFO, Pres., VP, Dir., Mgr.)
☐	☐	2. CIO/CTO/IS/IT/MIS/ Systems Management	☐	☐	5. Internet/Intranet/Web/ E-Commerce Management	☐	☐	8. Consultant (Independent)
☐	☐	3. LAN Management	☐	☐	6. Engineering Management	☐	☐	9. Other (please specify)

_____

3. What is the estimated value of network equipment and services that you specify, recommend, or approve the purchase of?

(Please print the appropriate number code on the line next to each product category. Please complete ALL categories A–O.)

1. $100 Million or more
2. $50 Million to $99.9 Million
3. $25 Million to $49.9 Million
4. $10 Million to $24.9 Million
5. $1 Million to $9.9 Million
6. $100,000 to $999,999
7. $50,000 to $99,999
8. Under $50,000
9. None of the above

A ____ Large Systems *(Mainframes/Minis)*
B ____ Desktops *(Micros/Laptops/ Workstations)*
C ____ Mobile *(including PDAs, Wireless)*
D ____ Servers
E ____ LANs
F ____ WAN Equipment
G ____ Carrier Services
H ____ Internet/Web/E-commerce
I ____ Intranet/Extranet
J ____ Internetworking *(including Routers, Switches)*
K ____ Storage
L ____ Remote Access
M ____ Peripherals
N ____ Software
O ____ Service/Support Services

4. What is the total number of sites for which you have purchase influence?

(check ONE only)

1. ☐ 100+ 2. ☐ 50 to 99 3. ☐ 20 to 49 4. ☐ 10 to 19 5. ☐ 2 to 9 6. ☐ 1 7. ☐ None

8. Please indicate the Web/Security/LAN/Internetworking/Wireless/Mobile/WAN Equipment/ Carrier Services that you are currently involved in purchasing or plan to purchase:

(check ALL that apply) A. Currently involved in purchasing B. Plan to purchase

WEB

A	B		A	B		A	B	
☐	☐	01. Web Servers/Software	☐	☐	04. Web Development Tools	☐	☐	07. Web Acceleration/Caching/ Load Balancing
☐	☐	02. Web Traffic Management	☐	☐	05. Web Content Management	☐	☐	08. Web Hosting Services
☐	☐	03. Electronic Commerce Tools	☐	☐	06. Web Collaboration/ Groupware	☐	☐	09. Other

SECURITY

A	B		A	B		A	B	
☐	☐	10. Firewalls	☐	☐	13. DES Encryption Tools	☐	☐	16. Certificate Authorities
☐	☐	11. Anti-Virus Software	☐	☐	14. Authentication Tools	☐	☐	17. Biometrics
☐	☐	12. Private Key Encryption Tools	☐	☐	15. Intrusion Detection	☐	☐	18. Other

LANs/INTERNETWORKING

A	B		A	B		A	B	
☐	☐	19. Fast Ethernet	☐	☐	26. Storage Backup (Optical, Disk, Tape, RAID)	☐	☐	30. Hubs/Intelligent Hubs/ Stackable Hubs
☐	☐	20. Gigabit Ethernet	☐	☐	27. Network Test/Diagnostic Tools	☐	☐	31. Cables,Connectors, Baluns
☐	☐	21. Layer 3-7 Switches	☐	☐	28. Uninterruptable Power Supplies (UPS)	☐	☐	32. Wiring/Fiber Systems
☐	☐	22. ATM Switches	☐	☐	29. Network Interface Cards (NICs, PCMCIA)	☐	☐	33. Net Management Systems
☐	☐	23. Routers				☐	☐	34. Voice Over IP (VoIP) Tools
☐	☐	24. Network Attached Storage (NAS)				☐	☐	35. Network Analyzers
☐	☐	25. Storage Area Networks (SANs)				☐	☐	36. Other Local-Area Network/ Internetworking

WIRELESS/MOBILE

A	B		A	B		A	B	
☐	☐	37. Wireless LANS	☐	☐	39. Wireless LAN Extension Tools	☐	☐	41. PDAs
☐	☐	38. Wireless/Cell Phones	☐	☐	40. Mobile Data Equipment/Services	☐	☐	42. Other Remote/Wireless

WAN EQUIPMENT

A	B		A	B		A	B	
☐	☐	43. Frame Relay Equipment	☐	☐	48. Voice/Video over IP Gateways	☐	☐	53. DSUs/CSUs
☐	☐	44. Bandwidth Managers	☐	☐	49. Modems	☐	☐	54. PBXs
☐	☐	45. Bandwidth Shaping/QOS Tools	☐	☐	50. Cable Modems	☐	☐	55. Call Center Tools
☐	☐	46. VPN Equipment	☐	☐	51. xDSL Products	☐	☐	56. Videoconferencing Gear
☐	☐	47. ATM Switches	☐	☐	52. Diagnostic/Test Equipment	☐	☐	57. ISDN Equipment/Services
						☐	☐	58. Other WAN Equipment/Services

CARRIER SERVICES

A	B		A	B		A	B	
☐	☐	59. Internet Access	☐	☐	64. ATM Services	☐	☐	69. Wavelength Services
☐	☐	60. Private Lines	☐	☐	65. Managed Services	☐	☐	70. Dark Fiber
☐	☐	61. Frame Relay Services	☐	☐	66. VPN Services	☐	☐	71. Other Carrier Services
☐	☐	62. ADSL/DSL	☐	☐	67. LAN-Extension Services			A B
☐	☐	63. T-1/T-3 Services	☐	☐	68. OC-3/OC-12	None of the above (1 – 71)		☐ ☐ 72.

9. Please indicate the Systems/Peripherals/Software/Applications/Business Services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)

A. Currently involved in purchasing B. Plan to purchase

SYSTEMS/PERIPHERALS

A	B		A	B		A	B	
☐	☐	01. Laptops/Notebooks	☐	☐	06. Fax Servers	☐	☐	10. Mainframes
☐	☐	02. Desktops	☐	☐	07. Remote Access Servers	☐	☐	11. Printers
☐	☐	03. Intel-Based Servers	☐	☐	08. Video Servers	☐	☐	12. Enclosures/Racks/Furniture
☐	☐	04. Risc-Based Servers	☐	☐	09. Mid-Range Systems (including workstations)	☐	☐	13. Other Computers/ Peripherals
☐	☐	05. Print Servers						

SOFTWARE/APPLICATIONS

A	B		A	B		A	B	
☐	☐	14. Desktop/Server Operating Systems	☐	☐	20. Database Management Systems	☐	☐	25. Middleware
☐	☐	15. Network Management	☐	☐	21. Customer Resource Management (CRM)	☐	☐	26. Document Management Tools
☐	☐	16. Systems Management	☐	☐	22. Enterprise Resource Planning (ERP)	☐	☐	27. Site Metering Tools
☐	☐	17. Directory Services	☐	☐	23. XML Tools	☐	☐	28. Software Distribution Tools
☐	☐	18. E-Mail	☐	☐	24. Desktop Videoconferencing	☐	☐	29. Data Warehousing
☐	☐	19. Groupware				☐	☐	30. Applications Development Tools
						☐	☐	31. Other Software/Applications

BUSINESS SERVICES

A	B		A	B		A	B	
☐	☐	32. Application Service Provider Services	☐	☐	33. Systems Integration/ Consulting	☐	☐	35. Other Services
			☐	☐	34. Education/Training Services	None of the above (1 – 35)		A B ☐ ☐ 36.

10. Please indicate the platforms that are currently installed/planned:

(check ALL that apply)

A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS

A	B		A	B		A	B	
☐	☐	01. TCP/IP v4	☐	☐	03. SNA/APPC/APPN/LU6.2	☐	☐	05. NETBIOS/NETBUEI
☐	☐	02. TCP/IP v6	☐	☐	04. Novell IPX/SPX	☐	☐	06. NFS
						☐	☐	07. Other Network Protocols

LAN/WAN ENVIRONMENT

A	B		A	B		A	B	
☐	☐	08. Gigabit Ethernet	☐	☐	13. Token Ring/Token Ring Switching	☐	☐	18. DSL
☐	☐	09. Switched Ethernet	☐	☐	14. Layer 3-7 Switching	☐	☐	19. ISDN
☐	☐	10. Fast Ethernet	☐	☐	15. FDDI	☐	☐	20. Frame Relay
☐	☐	11. Ethernet	☐	☐	16. Fibre Channel	☐	☐	21. Private Line T1, T3, OC-3, OC-12
☐	☐	12. ATM	☐	☐	17. Wireless LANs	☐	☐	22. Other LAN/WAN Environment

DESKTOP/SERVER OPERATING SYSTEMS

A	B		A	B		A	B	
☐	☐	23. Windows 2000	☐	☐	28. Intel Based UNIX	☐	☐	34. Palm OS
☐	☐	24. Windows 95/98	☐	☐	29. RISC Based UNIX (incl. SOLARIS)	☐	☐	35. Windows CE
☐	☐	25. Windows NT/Windows 2000	☐	☐	30. IBM MVS/VM/VSE/ESA	☐	☐	36. Other Network Operating System
☐	☐	26. Novell (NetWare 5.X, 4.X, 3.X, 2.X)	☐	☐	31. OS/400			A B
☐	☐	27. LINUX	☐	☐	32. Digital VMS	None of the above (1– 36)		☐ ☐ 37.
			☐	☐	33. Macintosh			

Continued on next page...

Continued from page one...

5. What is the total number of Servers/Clients installed/planned at your location/in your entire organization? (check ONE box in each column)

	SERVERS		CLIENTS	
	At Location (A)	Entire Org. (B)	At Location (C)	Entire Org. (D)
1.	☐	☐	☐	☐
2.	☐	☐	☐	☐
3.	☐	☐	☐	☐
4.	☐	☐	☐	☐
5.	☐	☐	☐	☐
6.	☐	☐	☐	☐
7.	☐	☐	☐	☐
8.	☐	☐	☐	☐

1. 50,000+
2. 10,000 to 49,999
3. 1,000 to 9,999
4. 100 to 999
5. 50 to 99
6. 10 to 49
7. 1 to 9
8. None

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check ONE only)

CORPORATE/ENTERPRISE:
1. ☐ Entire Enterprise/ Multiple Enterprises
2. ☐ Multinational Enterprise
3. ☐ Division/Multiple Divisions
4. ☐ Department
5. ☐ None

B. Involvement (check ALL that apply)
1. ☐ Create Network/IT Strategy
2. ☐ Recommend/Specify Brand
3. ☐ Approve Purchase
4. ☐ Evaluate Products/Services
5. ☐ Determine the Need
6. ☐ None

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7. What is the estimated number of employees in your entire organization/at your location? (check ONE in each section)

A. Entire organization:
1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 499 or less

B. At your location:
1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 250 – 499
8. ☐ 100 – 249
9. ☐ 99 or less

11. Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Servers
1. ☐ IBM (Mainframes)
2. ☐ IBM RS/6000
3. ☐ IBM AS/400
4. ☐ Compaq/Digital/ Tandem
5. ☐ Unisys
6. ☐ H-P
7. ☐ Other

B - Workstations/Desktops/Laptops
1. ☐ Sun Microsystems
2. ☐ H-P
3. ☐ Compaq/Digital
4. ☐ IBM
5. ☐ Dell
6. ☐ Gateway
7. ☐ Fujitsu
8. ☐ Other

12. What is the estimated gross revenue of your entire company/institution? (check ONE only)

1. ☐ $20 Billion or More
2. ☐ $10 Billion to $19.9 Billion
3. ☐ $1 Billion to $9.9 Billion
4. ☐ $500 Million to $999.9 Million
5. ☐ $100 Million to $499.9 Million
6. ☐ $50 Million to $99.9 Million
7. ☐ $10 Million to $49.9 Million
8. ☐ $5 Million to $9.9 Million
9. ☐ $4.9 Million or Less
10. ☐ None of the above

13. For which areas outside of the U.S.A. do you have purchase influence? (check ALL that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ Africa
7. ☐ Canada
8. ☐ None

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Net.Worker

Products, services and strategies for tying teleworkers to the enterprise

Briefs

WatchGuard Technologies last week extended its Firebox III family of firewall appliances to the small office. The Firebox 700 supports 250 simultaneous authenticated users and 150 simultaneous connected branch or mobile users' VPNs. It includes an ICSA firewall, IP Security VPN technology and management tools. The product costs $2,500 and includes a one-year subscription to WatchGuard's LiveSecurity Service.

WatchGuard: www.watchguard.com

Almost half of U.S. workers rely on a cell phone, pager or PDA, according to a recent report from **Cahners In-Stat Group.** The number of wireless users is expected to climb from 47% in 2001 to 60% by 2004. The report, "All business is eBusiness: Demand for mobile solutions & communications expenditures in the small, SOHO, middle and enterprise markets," found that small firms lead the way in wireless adoption.

Cahners: www.instat.com

Smith Micro has announced a desktop firewall product, **Check-IT Firewall.** The software controls access to the PC's communications ports and monitors port-scanning activity. Rules can be customized for specific applications, trusted IP addresses, ports or protocols. The product costs $40.

Smith Micro: www.smithmicro.com

Canon has shipped a new personal desktop copier. The PC940 prints 13 pages per minute and features zoom enlargement and reduction and 250-sheet front-loading paper cassette. It is recommended for small offices that churn out 2,000 copies per month. The copier costs $500.

Canon: www.usa.canon.com

Home-office ergonomics made easy

Provide your teleworkers with the creature comforts they need to stay productive.

BY STEVE JANSS

TELEWORKING TOP 10

An ongoing series designed to help set up your teleworkers for their small-office or home-office networks.

PART 9.

I ride my mountain bike through the desert several times a week, so when my wrist began to ache last year, I thought it was my riding. But it wasn't getting better, even when I stopped. It turned out to be carpal tunnel syndrome.

Fortunately, I recognized the symptoms before suffering permanent damage. A week away from computers gave my wrist a chance to heal. Since then, I've learned a few things about ergonomics that have helped to keep the condition at bay.

The technical term is "repetitive stress injury," or RSI. The Occupational Safety and Health Administration monitors all disorders that result from repetitive trauma, even if they are caused by moving your mouse back and forth on a neoprene pad.

Corporate ergonomics is more than just preventing repetitive stress injuries. It's about minimizing costs and maximizing long-term productivity by keeping all employees, including teleworkers, free from the devastating effects of poor design.

Many corporations have nailed the ergonomic equation for their corporate employees. But the setup for teleworkers is another story. A teleworker's office could be anything from a laptop on the kitchen counter to a bedroom crammed full of PCs. Unless you've visited, you have no way of knowing whether they're following the company's ergonomic policy. Advising your teleworkers on equipment and furniture can go a long way in preventing injuries.

Lessons in lighting

Good lighting reduces glare and squinting, as well as fatigue. If you find yourself leaning different ways to get a better angle, your lighting probably needs improvement.

My favorite lighting solution is a halogen touchier lamp and a reflective ceiling. The lamp costs $20 at Home Depot. The ceiling came with the house. The result — good, diffuse lighting with no glare or eyestrain. It's also a lot closer to natural light than fluorescent. Granted, it uses about five times as much electricity, but I'm footing the electric bill — not the company.

Furniture facts

Dina Muenier, a consultant with the Industrial Accident Prevention Association, reports that a worker suffering from RSI will collect an average of seven weeks of worker's compensation. Even a day's compensation can pay for a good office chair.

Since everyone is built differently, no chair meets everyone's needs. Instead of trying to guess their physiology, give your teleworkers a set of guidelines, a budget and directions to the nearest furniture store to find a chair that meets their needs. Expect to pay between $150 and $250.

Most office chairs are poorly designed. They lack proper lumbar support, comfortable armrests and the controls necessary to adjust to the worker. The best chairs include height adjustments for the chair and armrests, seat tilts, back angle adjustments and tension adjustments for the overall angle. The right chair is comfortable from the moment you sit down and stays that way after several hours of pounding the keyboard.

Desks should support the role of the teleworker. If the teleworker handles dozens of small pieces of paper, perhaps a traditional roll-top with some cubbyholes will work. Otherwise, stick to a desk with large flat surfaces. You can always add cubbyholes later.

Input/output feedback

Most computer-related RSIs result from manipulating data. However, if a teleworker is retyping large amounts of text, invest in a scanner with decent intelligent character recognition (ICR), such as Neuralscript's Intelli-Forms. Mitek is another contender, with seven distinct ICR products. If your needs are less demanding, try EDT's WinOCR Pro 4.0, for $40.

Numerous keyboards are available that place your hands at a more natural angle than the traditional layout. Unfortunately, most of them, such as Microsoft's Natural Keyboard, force you to rotate your wrists inward unnaturally. Others, such as the one from Pace Development, have a full six degrees of freedom, providing just the right adjustment for anyone. However, at $250, it's pricey — but it's still cheaper than losing a good employee.

Then again, why type when you can speak? Dragon Systems' NaturallySpeaking Version 5 comes in a variety of flavors — tailored for everyone from the home user to a corporate forms processor. Even though it's targeted toward smaller markets, I like IBM's ViaVoice Pro slightly more than NaturallySpeaking, in part because it learns from its own mistakes when you correct its errors on the spot.

One of the more promising technologies replaces the mouse with head- or eye-controlled sensors. NaturalPoint's TrackIR sits atop your monitor and lets you move the cursor simply by moving your head. It reflects IR off a reflective dot worn on your forehead, so don't forget to remove the dot before visitors arrive.

It's a neat idea, but for the moment I'll pass — I'm waiting for someone to pitch me a unit that uses IR to track my eye movement, which are a lot less prone to repetitive stress injuries than my neck.

Health hints

Educate your teleworkers on the importance of taking periodic breaks, and maintaining good exercise and nutritional habits to reduce the tissue damage associated with a repetitive stress injury. Finally, open feedback channels so they'll have a means of correcting something before it becomes a major medical problem.

Next story: Software sundries.

Janss is president of Jansys Information Systems, a consulting firm specializing in IS technologies for small businesses. He can be reached at bizcom@jansys.com.

www.nwfusion.com

SPECIALIZED SHOPPING

Read Part 8 in our Teleworker Top 10 series to find out how to choose the right computer peripheral equipment. Also get links to Parts 1 to 7.

DocFinder 5729

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Briefs

Sprint added 11 markets to its **Sprint Business DSL** service area last week. The provider now offers the service in 40 markets and plans to be in 86 markets by early next year. The latest additions include: Atlanta; Buffalo, N.Y.; Detroit; Nashville; New Orleans; Newport News, Va.; Norfolk, Va.; Portland, Ore.; Richmond, Va.; St. Louis; and Salt Lake City. Sprint's Business DSL plans start at $119 per month and offer asymmetric DSL speeds of up to 1.5M bit/sec downstream and 384K bit/sec upstream.

Sprint: www.sprint.com

Companies running e-businesses from shared hosting platforms now can benefit from **VeriSign's** third-party authentication services, which verify that a business owns the domain name it's using and that the business is what it says it is. Last week VeriSign unveiled its **Shared Hosting Security Service**, which provides the same authentication services to shared hosting e-businesses as those available to e-businesses running on dedicated platforms. The service will be marketed through ISPs and Web hosting companies under the name Secure Site Services.

Teledesic announced last week that it is close to selecting a satellite manufacturer to build its **Internet-in-the-Sky Network**. The company says it will choose either the Italian vendor **Alenia Spazio** or **Lockheed Martin Commercial Space Systems** as its network infrastructure partner. Teledesic, which was founded in 1999 by Craig McCaw and Bill Gates, says it will launch high-speed Internet access services in 2005.

Teledesic: www.teledesic.com

Game site gets boost from Digital Island

BY JENNIFER MEARS

If you're visiting GameStop.com, one of the largest online providers of video games, consoles and accessories in the world, chances are that time is of the essence. You want to be first on your block to get the latest PlayStation title or Dreamcast release.

Network downtime will not do.

That was at the top of CIO Jeff Donaldson's mind when GameStop.com decided to revamp its site to handle a growing customer base and began looking for a new Web hoster last fall. It settled on Digital Island, which offered the managed hosting services it needed, as well as a content delivery network (CDN).

"Our initial push was simply to look for a higher level of support, a better quality of support than what we had with the Web hosting company we were with," Donaldson says. "But when we did the research we found we were setting our sights too low. We saw that there was a better way to do business and a better way to support our Internet business."

Donaldson and his team began researching CDNs, which deliver content from geographically dispersed servers that sit at the edge of a network.

GameStop.com, a wholly owned subsidiary of Barnes & Noble, has been around since mid-1999 and in that time it has seen traffic to its site double, Donaldson says. GameStop.com now claims to average about 100,000 unique visitors per day, but when a new gaming product is released that number triples or quintuples.

Traffic spikes no fun for GameStop.com

How the company deals with spikes using Digital Island:



When traffic spiked, "we attacked the problem with hardware," Donaldson says. "Basically, we would try to project when we would have spikes, and we would put additional processors in place or an additional Web server and application server in place to handle it."

But, Donaldson acknowledges, sometimes connections to the Web site got dropped. He says having to throw extra hardware on the network was costly and risky, since modifications could lead to downtime.

"We wanted to be in an environment where that would not occur, and at the same time we wanted to combat the spikiness of our traffic in a different way," he says. "That was the No. 1 objective in deploying on a content delivery network,

See **Digital Island**, page 28

NextWave charges ahead despite FCC appeal

BY DENISE PAPPALARDO

Despite not officially holding spectrum licenses, NextWave Telecom is building a wireless network in 95 markets and has nailed billions in new financing.

Last week the embattled wireless service provider announced that UBS Warburg is providing a $2.5 billion debt allowance that the company will use to fund the construction of its third-generation (3G) wireless network. UBS Warburg is also NextWave's financial adviser.

Earlier this month NextWave also received $300 million from wireless equipment company Qualcomm. These new commitments are part of NextWave's $5 billion reorganization plan filed Aug. 6 with the U.S. Bankruptcy Court for the Southern District of New York. The court is expected to confirm or deny NextWave's plan by the end of October.

The plan also states that NextWave will not sell its services directly to consumers or business users, but will offer wholesale wireless data services to other carriers.

"In light of the competitive nature of the [wireless] market and when they will enter, it may be more feasible to offer wholesale services than to attack the traditional carriers that have legacy voice customers," says Eugene Signorini, analyst at consulting firm The Yankee Group.

The Yankee Group predicts there will be 11.4 million wireless users accessing e-mail, calendar and other data applications via handheld devices by year-end. That number is expected to jump to 52.8 million users by the end of 2004.

Companies such as AOL or Microsoft's MSN might be interested in branding their wireless service to their customers without having to deploy or manage a network, Signorini says. But he

See **NextWave**, page 28



Eye on the carriers . Johna Till Johnson

How 'the matrix' can win you boffo reviews

In my last column I discussed the rationale for negotiating your telecommunications contracts using the "matrix RFP." Forget Keanu Reeves: This matrix is a document inviting service providers to bid on specific services within specific geographical regions. I recommend that you send this document to as many service providers as you can — even those you've never heard of.

Let's assume you've followed that advice. Now you're inundated with 250-page responses from carriers. What happens next?

If you're like most network executives, one of your goals is to limit the number of providers you deal with. Maybe you even dream of handing off all your telecommunications needs to a single global supercarrier — and negotiating awesome, bulk discounts as part of the bargain.

It's not gonna happen, at least not in this universe. Unless your company is unusually small or homogeneous, there's no provider that can meet all your needs in all your locations.

Instead, you should use the matrix RFP to narrow the field to a short list of five to seven players that will go on to the next round of negotiations. The key criterion to making this cut is breadth: You'll favor providers that can fill the greatest number of squares on the matrix. A provider that can only offer local voice, for example, is out, in favor of a provider that could offer local voice, data and cellular, or local, long-distance and international services.

The easiest way to visualize this is to mark up a blank matrix with colors (or icons) indicating which providers offer services where. Squares that contain many check marks (say, Internet service in North America) are highly competitive; ones with few to no entries (say, data services in Africa) mean your choices are limited.

Now you're ready to move forward with Round Two. Go back to the five to seven providers that made the initial cut, and begin dickering with them regarding price and service levels. Please don't leave service-level agreement (SLA) negotiations until the end of the process, or you'll lose considerable negotiating leverage. A favorite trick of my clients is to use the superior SLAs provided by high-priced vendors such as Equant — now owned by France Telecom — against other providers, which end up offering similar SLAs, but at much lower cost.

Through aggressive negotiations you'll seek to reduce your number of providers to two or three that cover most of your telecom needs.

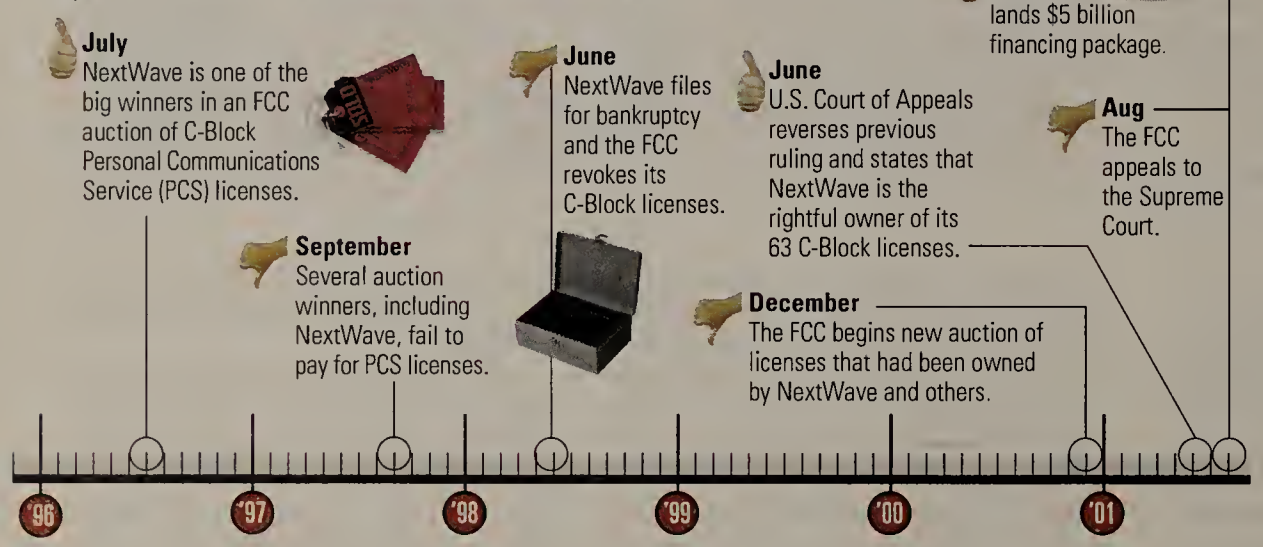
You may have noticed that this process is longer and more complex than the usual RFP negotiations, due to the extra step of creating the matrix. Why bother? Quite simply, it's the best tool we've discovered for simultaneously lowering costs, improving service quality, and reducing the number of carriers. One client of mine was able to reduce overall global telecommunications costs by 35% using this approach, and that included an overall increase in bandwidth consumption.

And that's no science fiction fantasy.

Johnson is senior vice president and CTO for Greenwich Technology Partners, a network consulting and engineering firm. She can be reached at johna@greenwichtech.com.

NextWave's ups and downs

Through financial hardships and court battles, NextWave has been trying to get its hands on wireless licenses it won in 1996.



NextWave,
continued from page 27

believes NextWave will have an uphill battle.

"Any wireless service provider would rather hold its own licenses and network infrastructure," he says.

And because NextWave hasn't made friends with some of the biggest wireless services providers in the industry, it may have a difficult time reselling its network to the likes of AT&T, Verizon or VoiceStream.

The animosity stems from the fact that NextWave is trying to take back the licenses that it won in 1996 — and subsequently lost — from the very providers that acquired the disputed licenses just this year.

Soon after NextWave filed for bankruptcy in 1998 the Federal Communications Commission repossessed the company's licenses.

The FCC resold the licenses to companies such as Verizon, Cingular (BellSouth and SBC's joint venture), VoiceStream and an AT&T affiliate called Alaska Native in an auction that closed in January. The licenses were repossessed and resold because NextWave failed to pay for them.

After a multitude of court battles, NextWave saw its first win this June when the appeals court ruled that the FCC did not act in accordance with bankruptcy code. The upshot was that the licenses still belong to NextWave. Or do they?

NextWave claims the FCC "explicitly said if NextWave won the appeals case it would return the licenses and would not continue litigation," says Ray Berger, senior vice president of marketing at NextWave. But the FCC is taking its fight to the Supreme Court, which could delay any decision by a year.

However, NextWave isn't waiting. It's building out its network with 1xRT Code Division Multiple Access 2000 2.5G gear that will support mobile wireless data transmissions at 144K bit/sec. The company says its network will primarily offer data services when completed early next year.

NextWave's network will cover 95 markets in 30 states and Washington, D.C. ◪

Digital Island,
continued from page 27

because ... that's going to take a lot of the load off the back-end servers."

Donaldson looked at several Web hosters and CDN service providers, including Akamai, Data Return, Internap, Exodus, and telecom companies.

GameStop.com chose Digital Island because of its expertise in the entertainment industry (it hosts content for Sega, Universal Music Group, Fox and AOL) and its partnerships with companies such as Microsoft and Sun. Another reason was Digital Island could provide managed hosting services and operated its own CDN, he says.

Donaldson knew that as the game market heated up, GameStop.com would need to offer online gaming to stay competitive and a CDN would be the best way to handle that chore.

Since GameStop.com was re-architecting its site, the transition from one Web hoster to another went smoothly, he says.

GameStop.com has about a dozen servers hosted at Digital Island's data center in California and has its static content distributed across Digital Island's Footprint CDN. Customers get the static content delivered from whatever Footprint server is closest to them; dynamic content comes from a server hosted at Digital Island's data center.

A customer makes a selection from a variety of games and accessories. The order, along with personal information, such as credit card numbers and e-mail addresses, are encrypted using Secure Sockets Layer and sent to a database hosted at a Digital Island data center.

Throughout the day, order information is sent through an encrypted Internet tunnel to GameStop.com's back-end systems. An e-mail confirmation is sent to the buyer and another e-mail is sent when the order is shipped. Also, order status is sent to the Web site and displayed to the customer.

Donaldson won't be specific about cost savings, but says they're "significant." Neither Donaldson nor Digital Island will comment on pricing, but Digital Island's CDN pricing is pay-per-use, meaning customers are only charged for the bandwidth that is used rather than a flat rate per month.

What's more, Donaldson can sleep at night during product launches — Microsoft is launching XBox and Nintendo is launching Game Cube this fall — and the holiday season, when the number of visitors in a day could top 750,000.

"You remember the excitement last Christmas over PlayStation 2? Well, you can multiply that by three this Christmas," Donaldson says. ◪



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Briefs

Metrobility Optical Systems last week announced the release of T-1/E-1 fiber connectivity modules designed to transport T-1 or E-1 traffic across singlemode fiber at distances up to 62 miles.

The products eliminate the need for costly repeaters and reduce cost of ownership, Metrobility claims. The products incorporate remote and local testing of outgoing signals — or loopback testing, built-in bit error rate testing and intelligent software management.

The T-1/E-1 fiber connectivity modules are available for Metrobility's Radiance and Lancast product lines. The products will be available in the fourth quarter with prices starting at $750.

Metrobility: www.metrobility.com

Princeton Optronics last week announced it has closed a second round of financing in the amount of $25 million.

Co-led by Investor Growth Capital and St. Paul Venture Capital, this round also includes investments from Technology Venture Partners and first round investors Novak Biddle and Intel Capital.

This additional capital will fund the final development stage of Princeton Optronics' PowerSweep 2000, a tunable laser, and scale operations in support of its 12.5G-bit/sec receiver and modulator driver product lines.

Princeton Optronics: www.princetonoptronics.com

The Resilient Packet Ring Alliance last week announced three additional members.

They are Alcatel; NEC and Huawei Tech, a provider of telecom gear in China. These new members increase RPR's membership to 16 optical networking and chip companies.

RPR: www.rpralliance.org

RouteScience adds twist to 'Net routing

Company overrides BGP path selection to select best performing ISP routes for Internet traffic.

BY JIM DUFFY

RouteScience, a 2-year-old company developing policy- and performance-based routing products, last week unveiled its first offering.

PathControl is a device that monitors the performance of client/server transactions across several ISP networks to calculate the best performing path through that multihomed network. Once PathControl determines the optimal path based on performance, it overrides Border Gateway Protocol (BGP) path selection in edge routers.

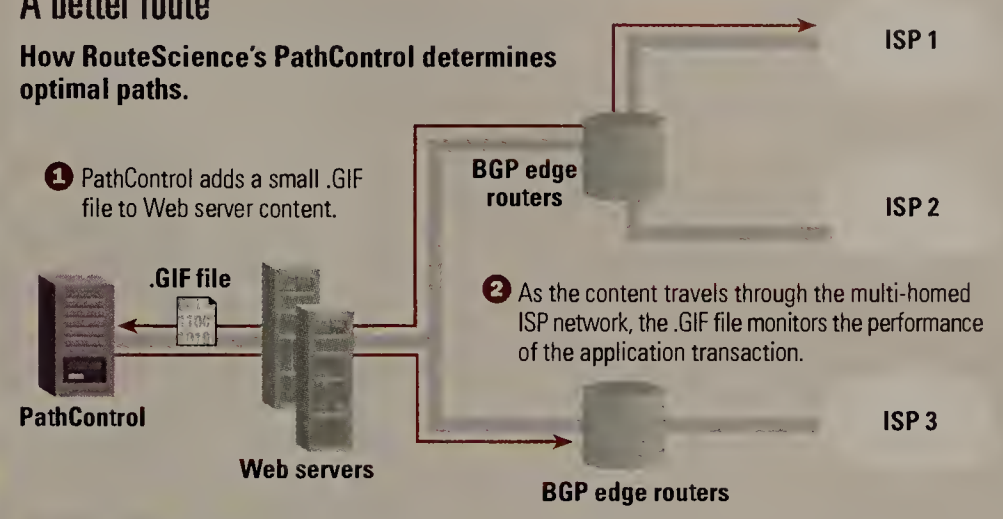
PathControl sits at the edge of Tier 2/3 ISP and Web hosting service provider networks or at the WAN edge of enterprise networks. When a Web server receives a request for content, PathControl adds a .GIF file of a few hundred bytes to the content to monitor the performance of the request/receive transaction through the Internet.

Based on this performance data, PathControl updates BGP edge routers with policies on where to route specific IP address destination prefixes for optimal performance. PathControl can even determine optimal routes among Label Switched Paths engineered through Multi-protocol Label Switching, company

See **RouteScience**, page 32

A better route

How RouteScience's PathControl determines optimal paths.



Crossbeam integrates security, data center protection

Modular platform designed to replace multiple point products.

BY TIM GREENE

TORONTO — Crossbeam Systems this week is introducing a system designed to protect data centers by integrating a range of security services typically offered by multiple products.

The X40 Network Application Concentrator is a single chassis that can replace an assortment of security gear used to protect sites exposed to the Internet. These other devices include load-balancing switches, the firewall appliances they support and other security servers that scan for such threats as intrusion attempts and denial-of-service attacks.

By combining these functions in a single chassis, service providers can reduce the number of devices needed to support security services, making management simpler, Crossbeam President Steve Justus says.

In addition to protecting data centers from Internet attacks, the X40 can be used to support security services such as network-based firewalls. The X40 can also run firewall applications five times faster than firewall-specific processors, Justus claims.

The X40 is a 14-slot chassis that holds two, one-port Gigabit Ethernet I/O cards and two control-plane cards. The remaining 10 slots are reserved for application processing modules, where, for instance, firewall software would be supported. In its first release, X40 supports only Check Point Software VPN-1/Firewall-1, but it will support other applications from other vendors by year-end. These will include intrusion detection, distributed denial-of-service attack prevention and content filtering, Justus says.

The X40 is based on Linux, so any Linux-based application can be loaded on an Application Processing Module. Crossbeam plans to work with certain application vendors, such as Check Point, so the application is more tightly integrated with the X40 platform.

This will result in a broader range of applications, says Jeff Phillips, an analyst with TeleChoice. "They don't have to try to be the best in the world at everything," he says.

The entry price of the X40 is $64,000. It will be available in December.

Crossbeam: www.crossbeam.com

www.nwfusion.com

MORE VPN PARTNERSHIPS

Read about how Check Point Software recently announced three partnerships that will result in firewall and VPN protection for data centers and application servers.

DocFinder 5731

find it online

Vendors see network equipment sales plummet

Across-the-board Q2 slump in service provider gear due to reduction in spending, tough capital market.

BY JIM DUFFY

The second quarter saw sales drop across the board for most network equipment tailored to service providers, according to two market research firms.

Sales of routers, optical transport gear, WAN switches, LAN switches for Web hosting and packet telephony gateways all declined in the second quarter from the first quarter, according to Cahners In-Stat and Dell'Oro Group. The research firms again cited the dramatic reduction in service provider spending as the culprit. Service providers are also looking to squeeze as much out of their existing systems and only now are deploying equipment they purchased last year, the firms say.

> ■ ***Sales of routers, optical transport gear, WAN switches, LAN switches for Web hosting and packet telephony gateways all declined in the second quarter.***
>
> Cahners In-Stat and Dell'Oro Group

The total router market in the second quarter declined 9% from the first quarter of 2001, and 16% from the second quarter of 2000, to $2.5 billion, according to Cahners. High-end and terabit routers declined 13% and 14% respectively, the firm stated.

Dell'Oro's figures for high-end routers — those capable of OC-48 and OC-192 speeds — show a revenue decline of 28% between the first and second quarters. Dell'Oro said the market for OC-48-capable devices declined by more than 50% from the first quarter, from $505 million to $249 million.

Cisco and Juniper Networks, the distant leaders in this market, swapped share evenly: Cisco's share declined to 70% from 80% in the first quarter, while Juniper gained 10%, from 19% in the first quarter to 29% in the second quarter.

The market for OC-192-capable Internet core routers actually grew 16%, from $247.1 million in the first quarter to $286 million in the second quarter, according to Dell'Oro. Cisco nearly quadrupled its revenue in this market during this time and tripled its market share. Juniper lost ground, as its revenue declined 40% and its market share dropped from 77% in the first quarter to 40% in the second quarter.

Avici Systems, the third leading vendor in OC-192 routers, saw its market share increase 25% between the first and second quarters, from 6% to 7.5%.

Multiservice WAN switch revenue was $1 billion, a decrease of 28% from the first quarter of 2001, Cahners reported. In this market, service providers economized on capital spending by using existing equipment as much as possible and adding more, higher-density cards to this equipment to handle traffic growth, Cahners said.

Optical insight

In the optical market, sales of dense wavelength division multiplexing (DWDM) and SONET/SDH gear declined 16% from the first to second quarters, according to Dell'Oro. Lucent assumed market leadership from Nortel, which saw its sales decline by more than 50%.

Nortel also lost its market leadership in long-haul DWDM with a 64% decline in revenue, and in SONET/SDH equipment, with a 50% drop in sales, Dell'Oro said. Nortel maintained its leadership in metropolitan DWDM even though revenue declined 16%.

The Layer 2/3/4 to 7 switch market shrank 9% as ports shipped dropped to 31.53 million from 34.83 million in the first quarter, according to Cahners. Revenues shrank 15% to $3.62 billion.

Gigabit Ethernet, Layer 3 and modular switches drove ports and revenue, Cahners reported.

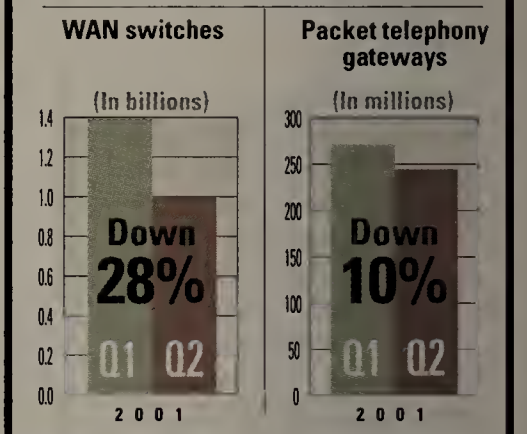
Layer 4 to 7 Gigabit Ethernet switches outperformed the overall market for the quarter, Cahners stated. Moderate switch growth is expected to resume in the second half of 2001, where Fast Ethernet and Layer 3 products will drive unit shipments, and Layer 3/4 to 7 and Gigabit Ethernet will drive revenue growth, the research firm predicts.

Packet telephony gateway revenue totaled $243.2 million in the second quarter, representing a 10% decline vs. the previous quarter, Cahners reported. Third-quarter port shipment growth is expected to be flat compared with the second quarter.

Packet telephony gateways are faring much better than some other segments in this tough environment, Cahners stated. As a means to reduce cost and expand services, sales of packet telephony gateways are expected to flourish when the industry slump abates. ◪

Tough quarter

Reduced spending prompted a drop in worldwide Q2 sales of WAN switches, packet telephony gateways.



SOURCE: CAHNERS IN-STAT

RouteScience,
continued from page 31

officials say.

PathControl does not determine least-cost routing, but lets users define route policies based on ISP link cost and performance.

Not unique

The RouteScience proposition is an intriguing one, but not unique, analysts say.

"RouteScience is part of this evolution beyond the network-based service level management folks," says Paul Bugala, research analyst at IDC. "There's a group of people including netVmg and Caimis who are all kind of trying to find the routing paths less traveled by either manipulating BGP or doing their own sort of simulation. They're taking these real complex routing algorithms and trying to apply those to the public network and find these loopholes in routing paths other people aren't taking to circumvent multivendor service-level agreements."

Indeed, the technology behind PathControl is an evolution of older network simulation products from Wavetek Wandel Goltermann and Make Systems, which is now a division of Opnet Technologies, Bugala says. Network testing vendors are also venturing into the route-path engineering and optimization waters, he says.

"It's another sort of ironic twist in this trend toward what were once wonkish, internally developed traffic engineering products making their way into more service-centric contexts," Bugala says.

That may be the appropriate context in which to describe PathControl. The product can double the application transaction speed for 50% to 80% of destinations, on average, and up to 10 times faster for "poorly served" end users, RouteScience claims. PathControl can also provide predictable, deterministic Internet performance regardless of the amount of congestion and delay in the Internet core, the company says.

PathControl performance measurement instrumentation — the small .GIF file — is a passive, non-intrusive agent that avoids pings and uses minimal network resources, RouteScience says. The device also generates hundreds of thousands of updates daily and can send them automatically to BGP edge routers.

The system generates real-time prefix-by-prefix ISP performance and route-optimization reports that can be used to evaluate end-to-end transaction performance and negotiate SLAs. PathControl is in field trials and is expected to ship in October. Pricing ranges from $140,000 to $250,000, depending on the device configuration.

Entry-level pricing includes a modular, 14-slot chassis that occupies eight rack units and support for two ISP links. Optional modules can be added to support additional ISP links and enhanced reporting features.

Former Cisco executives Herb Madan, Jim McGuire and Joel Evanier founded RouteScience in December 1999. These executives also founded performance management vendor Netsys Technologies in 1991. Cisco acquired Netsys in 1996.

RouteScience has 85 employees, and is headquartered in San Mateo, Calif., with operations in Boston.

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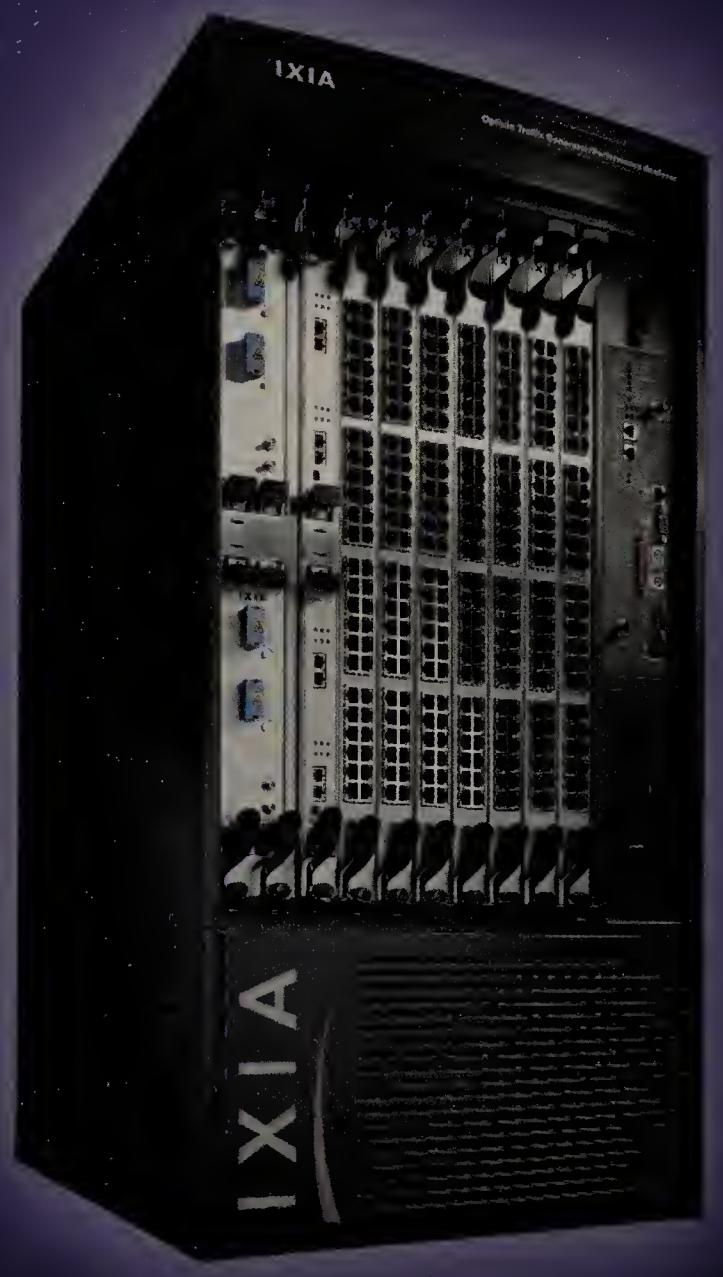
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Briefs

IBM and customer relationship management vendor **Siebel Systems** have made Siebel's line of **eBusiness** software available for IBM's **eServer iSeries**. The Siebel eBusiness Application software line was made available on OS/400 Version 4 Release 5 last week. A release of the Siebel software on the OS/400 Version 5 Release 1 is to be launched within the next two months. The Siebel software will be made available across the IBM eServer product line in the future, the companies say.

IBM: www.ibm.com; Siebel: www.siebel.com

Intesource, a provider of Web-based procurement services to grocery and healthcare buyers, and **Cleartrack Information Network** recently partnered to deliver online procurement and distribution services for the entire supply chain, from supplier negotiations to dock delivery and post-delivery analysis. Services will be delivered through a hosted application. Cleartrack makes the **Hawk Next Generation Visibility software** that monitors shipments and sends immediate notifications about a shipment's status.

Intesource: www.intesource.com; Cleartrack: www.cleartrack.com

Central Command last week released the **AntiVirus eXpert Professional 6**, an antivirus defense and Internet application firewall. The company claims AntiVirus eXpert 6 can detect and remove more than 52,000 known viruses. It could also stop unauthorized applications from accessing the Internet and includes a real-time content virus scanner to intercept viruses and other malicious applications as computer files are accessed. Pricing begins at $50.

Central Command: www.centralcommand.com

Cisco beefs up VoIP management

BY PHIL HOCHMUTH

Cisco's new and enhanced management packages should help users more effectively monitor the status of key voice-over-IP gear and run Web hosting servers.

Announced last week, CiscoWorks VoIP Health Monitor software product brings status monitoring and alerts of IP voice gear — Cisco CallManager servers, voice-over-IP gateways and Catalyst switch port modules — in addition to other Cisco products into a single management interface.

Previous Cisco voice-over-IP management software was limited to a Web interface used to access individual CallManager servers to check status or view system alerts and statistics.

The software can also monitor and provide reports on 175 other Cisco router and switch products, giving users a total view of voice and data in an IP network, the company says. The software runs on the Windows 2000 server platform.

Cisco also rolled out the 1105 Hosting Solution Engine, a management appliance aimed at networks with Web servers attached to server load balancers and firewalls. The device allows for better management of Web gear and monitoring of Web traffic, Cisco officials say.

Growing Voice

Research firm IDC says that revenue for software that manages voice-over-IP networks will grow to almost $754 million by 2004 as the technology starts to take off.

Also announced were two voice-related additions to the CiscoWorks QoS Policy Manager and Service Management Solution software products. For the Policy Manager, a voice over IP-based "template" — a bundle of preconfigured quality-of-service settings — is now available to let customers add the correct QoS settings for voice on an IP network.

Voice features, added to the Service Management product, which tests and measures data network performance, will let customers set thresholds and alerts based on the bandwidth requirements for voice.

Users say the QoS templates for the QoS Policy Manager should help new customers of Cisco's Architecture for Voice Video and Integrated Data IP voice equipment, says Patrick Olson, CIO of Menlo College in Atherton, Calif. Olson has been running Cisco CallManager servers and 600 IP phones for the past year. Olson also uses CiscoWorks QoS Policy Manager and has beta-tested voice QoS templates.

"For some installs, it will be a useful product for helping people set up QoS properly, which can be difficult," Olson says, adding that he's figured out the right QoS settings for voice on his network.

Cisco's 1105 Hosting Solution Engine is an IOS-based, one rack-unit-high (1.75 inches) appliance that can sit between a network of Web servers and load-balancing devices and let customers bring servers up and take them offline without having to manually reconfigure load-balancing equipment. According to Cisco, the idea for the product came partly from its own IT department, where the team that managed Web server farms needed a way to easily take load-balanced servers offline and online.

The product can also be used to gather statistics on Layer 4 through 7 traffic in a network, giving users information on the kind of traffic flows hitting their Web servers and the performance of load-balancing switches. The appliance can be accessed through a PC where a graphical interface is used

See **Cisco**, page 36

Symantec improves security wares

BY KATHLEEN OHLSON

CUPERTINO, CALIF. — Looking to help customers fill security gaps in their networks, Symantec next week is expected to unveil upgrades for its Norton Internet Security and SystemWorks software suite. The company has also bulked up its Norton AntiVirus software.

The need for stronger antivirus and security software is increasing as recent attacks such as the Anna Kournikova and Code Red viruses are spreading faster than earlier attacks such as Melissa. The enhanced software will also help keep Symantec in step with chief security rivals Network Associates and Trend Micro.

For its flagship package, Norton AntiVirus 2002 offers e-mail scanning, script blocking, automatic virus deletion, intelligent alerts and a new interface. The software scans e-mail — as it arrives in an inbox and as it leaves — to check for viruses contained in attachments.

Attachments have contained some of the most widespread viruses and worms, including LoveLetter and Melissa. These worms often spread using Microsoft Visual Basic Script files. In addition to scanning e-mails, Norton AntiVirus 2002 offers a script-blocking feature to filter out such potentially troublesome attachments and can even stop e-mails that may contain infected attachments from being sent, Symantec said.

The software also automatically updates virus definitions and links to Symantec's online virus encyclopedia.

David DeBacker of Erie Team PA CareerLink says automating any aspect of security will save his staff time and lets them tackle more complex problems.

"The benefit for me is my time and my staff's time . . . the less time we spend racing around the easier it is [for us]," says DeBacker, a regional MIS director at the Erie, Pa., career services company. Erie CareerLink will load AntiVirus 2002 on 25 laptops later this year.

Symantec also bolstered its System-

See **Symantec**, page 36

Symantec bulks up security wares

The following features will appear in upcoming releases of these security products:

Norton AntiVirus 2002

- Inbound and outbound e-mail scanning.

Internet Security 2002

- Parental and privacy control.
- Home Network Wizard, which detects systems on a user's home network.
- Auto LiveUpdate keeps virus detections current.

Norton SystemWorks 2002

- One Button Checkup lets users schedule automatic system checks.



'Net Insider . Scott Bradner

Billing for voice over IP? Not that easy!

It's quite reasonable for a phone company to want to make a buck off IP-based services, but it's not necessarily going to be easy to do. The tried and true techniques from the phone world just may not fit all that well.

An article in the August *Business Communications Review*, an old-line "phone-think" publication, is about "Call accounting and billing for IP services." The lead-in for the article says to "Expect higher prices and more complicated bills when Window XP triggers new [voice-over-IP] services and service providers roll out new IP billing systems." Sweet music to the ears of traditional telecommunications service providers, indeed. Too bad the tune will not be as pretty in the real world.

A basic assumption in the article is that voice over IP automatically means that a service provider can send bigger bills to their customers. But that assumption is fundamentally flawed.

If I'm sitting at a Windows XP machine at Harvard using the new voice-over-IP applications I could be making one of two types of calls. I could be calling someone else on the Internet or I could be calling someone on the regular telephone system. The latter is much more likely because there are more than a billion non-IP phones and only a few IP phones. But in both cases, there is no reason my local ISP would know I'm doing anything with voice over IP.

If I'm calling someone else on the Internet, my PC can connect directly to their PC or their local proxy and all the ISP sees is packets. I would not expect any quality-of-service (QoS) issues on my end because the local net is not all that loaded, and Harvard has a big connection to its ISP. There may be QoS issues on the other end, but there is not much I or the local ISP can do about that any time soon.

If I'm calling someone on the phone network I need to go through an Internet-to-phone network gateway. But there is no requirement that the gateway be operated by the local ISP or even an ISP at all. It could be operated by a company halfway around the world. Again, no local ISP involvement and no opportunity to add fees to the bill. The company operating the gateway can send me a bill but the ISP can't unless I'm using their gateway.

Only if the local ISP provides gateway or other voice-over-IP services that are better or lower cost than my other options will I use them. This is the challenge they will have to meet if they expect to send those bigger bills.

Disclaimer: "Harvard" and "better" fit together but "Harvard" and "lower cost"? In any case, the above opinion is mine.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Symantec,
continued from page 35

Works and Internet Security software suites.

SystemWorks 2002 features GoBack 3 Personal Edition, a software program that lets users recover data in case of a system crash, a virus attack, a failed software installation or user error. GoBack returns their system to the time it was working properly and the data was intact.

The SystemWorks suite also includes AntiVirus, Utilities 2002 and CleanSweep 2002. Utilities is a tool set that keeps hard drives organized to maximize space and speed access. It can run continuously in the background to detect potential disk and system problems.

CleanSweep removes unwanted programs, files and debris accumulated by Web surfing.

The Internet Security 2002 suite now includes Norton Personal Firewall 2002 and Norton AntiVirus 2002. The personal firewall controls all Internet connections to and from the computer and blocks attempted intrusions.

AntiVirus, SystemWorks and Internet Security will all support Microsoft's Windows XP operating system, as well as Windows NT, 98 and 2000.

Norton AntiVirus 2002 will be released Sept. 1, while Norton Internet Security 2002 and SystemWorks 2002 will be available in mid-September. AntiVirus will cost $50, Internet Security will cost $70 and SystemWorks will start at $70.

Symantec: www.symantec.com

Cisco,
continued from page 35

to make system changes.

By putting this management function in a rack-unit appliance, Cisco is targeting the device at Web hosting service providers.

The CiscoWorks VoIP Health Monitor software is available now and costs $20,000. The hardware-based Cisco 1105 Hosting Solutions Engine will be available in mid-September for $20,000.

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Security companies team to fight DoS attacks

BY SAM COSTELLO

McAfee, a division of Network Associates, last week said it would team with anti-denial of service companies Mazu Networks, Asta Networks and Arbor Networks to develop a method of stopping DOS attacks.

The initiative will seek to identify when networks are under attack, but also to determine whether the systems involved in the attack are acting knowingly, or whether they've been taken over and are being used by attackers, McAfee said.

The effort will see all four companies sharing research, expertise and data, says Stefan Savage, chief scientist at Asta. McAfee will offer the companies forensic data about the structure, code and behavior of worms and viruses, whereas Asta will be able to offer network-level data and tracking, he says.

Work resulting from the partnership will "tie these two pieces [forensic and tracking] of the puzzle together," Savage says, adding that it will also "let us both characterize attacks better and prescribe better defenses."

Sharing this information will aid the companies and their customers as "it will be of overall benefit to all of us that we're all informed about what's going on," Savage says.

The partnership will not only see the exchange of data, but will also lead to updates and added features in existing products, according to Savage and Vincent Gullotto, senior director of McAfee's Avert Labs.

"We're developing technology that will eventually end up in our products as they are today," rather than in new products, Gullotto says. The first fruits of this work should start to appear within six months, he says.

Arbor, Mazu and Asta are all direct competitors in the anti-DoS market. However, Savage has no qualms about working and sharing data with his rivals.

"There's a big difference between sharing the information and being able to use it," Savage says.

No matter who can use what information, though, all sides stand to benefit, he adds.

"The value of this relationship will come down to how much each side puts in," Savage says.

McAfee also says it will add features to its line of antivirus products that will let users identify, block or eliminate programs that would let an attack take over the user's computer for use in a DoS attack.

Such programs, installed on users' computers by attackers or through e-mail or Web-based worms, turn the systems into "zombies," machines that can be taken over without their owners' knowledge.

The Code Red II worm, which emerged in early August as variant of the original Code Red (although it is related in name only), installed a backdoor in infected systems that would let an attacker gain access to and control over them. Once such machines have been taken over, they can be used in DoS attacks, such as the attacks that knocked Yahoo, eBay, Amazon.com and other sites offline in the winter of 2000.

McAfee says updates to its antivirus products will allow for scans of incoming HTTP traffic to eliminate such programs.

The first McAfee product that incorporates the HTTP scanning technology is the company's recently released WebShield e500 Gateway device, says Tony Thompson, public relations representative for McAfee. Other McAfee hardware and software offerings will have the technology added in their next upgrades, he says.

Costello is a correspondent with IDG News Services' Boston bureau.

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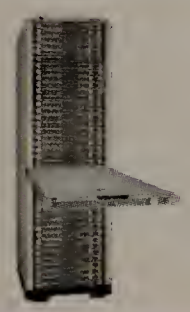


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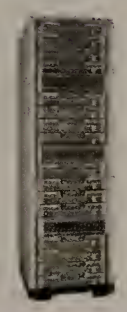


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Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Internet



By Steve Blass

We work in a Singapore bank. An employee at a branch office can access our intranet human resources system but can't access our other intranet, which is on another server. When the employee tries to access the other intranet, it tries to establish a connection, then he gets the message, "The page cannot be displayed." Our other branches can access both systems.

The answer lies in some configuration difference between the branches. The ability to reach the human resources server indicates that the connectivity basics are in place. Reasons why you can reach one server and not the other could lie in the servers, or in the network elements between the servers and the client, or in the network elements between the intranet servers. Look for traffic-filtering rules in the routers and firewalls that refer to your branch-office networks, and examine them for differences between the branches. Review your intranet server configurations for rules that allow or deny connections based on IP address or domain names, and check for differences between your branches there. Look in the intranet server access logs for clues as to whether the Web page request is getting to the server. If the page request is getting to the server, then look at the network elements between the client and server to find the culprit that is blocking the return traffic to the client.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

Resilient Packet Ring offers QoS

BY RUSS SHARER

With data traffic now surpassing voice traffic on the global public network, a new group of carrier-grade technologies has begun to emerge. Circuit, fixed bandwidth and static provisioning technologies, which have been the WAN mainstay, are being challenged by faster, packet-oriented, dynamic and self-provisioning technologies that are used in LANs.

One promising technology is Resilient Packet Ring (RPR), now being standardized by the IEEE 802.17 working group. RPR defines a new media access control (MAC) layer that is physical-layer independent and is optimized to address multiservice networks over ring topologies, particularly in metropolitan and access networks.

The MAC layer will work with an Ethernet physical layer, which initially operates at 10G bit/sec or below, or with SONET physical layers, which support transmission monitoring and optical management.

Each MAC layer manages a series of physical or logical ring channels consisting of a transmit or receive link on a full-duplex Gigabit Ethernet link, a concatenated SONET channel or an added (transmit) or dropped (receive) wavelength in a wave division multiplexing system.

In an RPR ring, there are at least four ring channels, with receive and transmit traffic flowing in opposite directions. A ring segment is defined as the portion of the ring between two MAC layers or nodes on the RPR network. The MAC manages traffic around its ring segments, adding transmit traffic if the destination is upstream or removing and terminating traffic if its node is the ultimate destination of the data.

RPR utilizes an Ethernet physical layer to minimize development costs and ride the silicon volume/cost curve, but the MAC is not Ethernet and will not interoperate directly with Ethernet networks. The change from existing Ethernet infrastructure interfaces is the biggest drawback of the standard. However, when using an Ethernet physical layer, Ethernet networks can be bridged at the RPR network edge.

The other key elements of the RPR protocol are the virtual media identifiers, which overlay virtual LANs on the RPR ring. Virtual media identifiers are a part of the RPR frame header and provide traffic management and switching between nodes.

RPR provides four key attributes:

- Dynamic bandwidth allocation — Bandwidth flows at the demand of users, without preprovisioning, to let multiple messages simultaneously move on a ring.
- Resiliency — RPR recognizes ring or node failures in less than 50 msec. Once a failure is recognized, traffic is rerouted on a secondary path or in a secondary direction.
- Simplified provisioning — RPR creates data paths through MAC layer addressing, eliminating the need to create connection-oriented circuits or virtual circuits. This includes autodiscovery of network topology, and establishing primary and secondary switching routes.
- QoS — QoS is accomplished by characterizing transmitted traffic according to its acceptable latency and jitter characteristics. These characteristics are handled in a three-bit class-of-service field in the RPR frame header.

RPR supports five classes of service:

- Express Forwarding, for time-sensitive committed-class traffic, such as legacy leased line or voice over IP.
- Assured Forwarding Three, for time-sensitive committed-class video traffic.
- Assured Forwarding Two, for time-insensitive committed-class traffic, such as committed data services (similar to constant bit rate for ATM).
- Assured Forwarding One, for time-insensitive overcommitted-class traffic (similar to burst rates for ATM).
- Best Effort, for delay-tolerant data services.

Each RPR MAC layer must also support cut-through and store-and-forward traffic to let priority or latency traffic move ahead of other traffic at ring nodes.

Through RPR's class of service, all types of carrier traffic, from large data files to latency-sensitive voice and video transmissions, can be transmitted on a packet network.

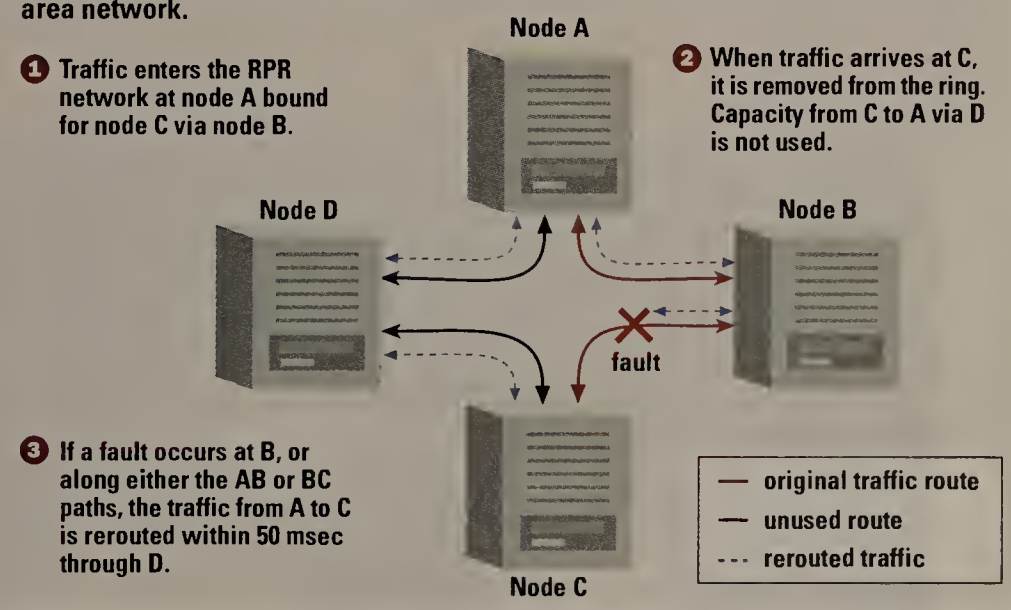
Circuits become packet flows with guaranteed limits on delay and jitter. Point-to-point, point-to-multipoint and multipoint peered networks can be overlaid on the RPR MAC layers. RPR's class of service makes it possible for scalable service-level agreements to be built in guaranteed-bandwidth increments of 1M bit/sec, with bursts up to 10M bit/sec. It is also possible to establish circuit-oriented connections through protocols such as Multi-protocol Label Switching.

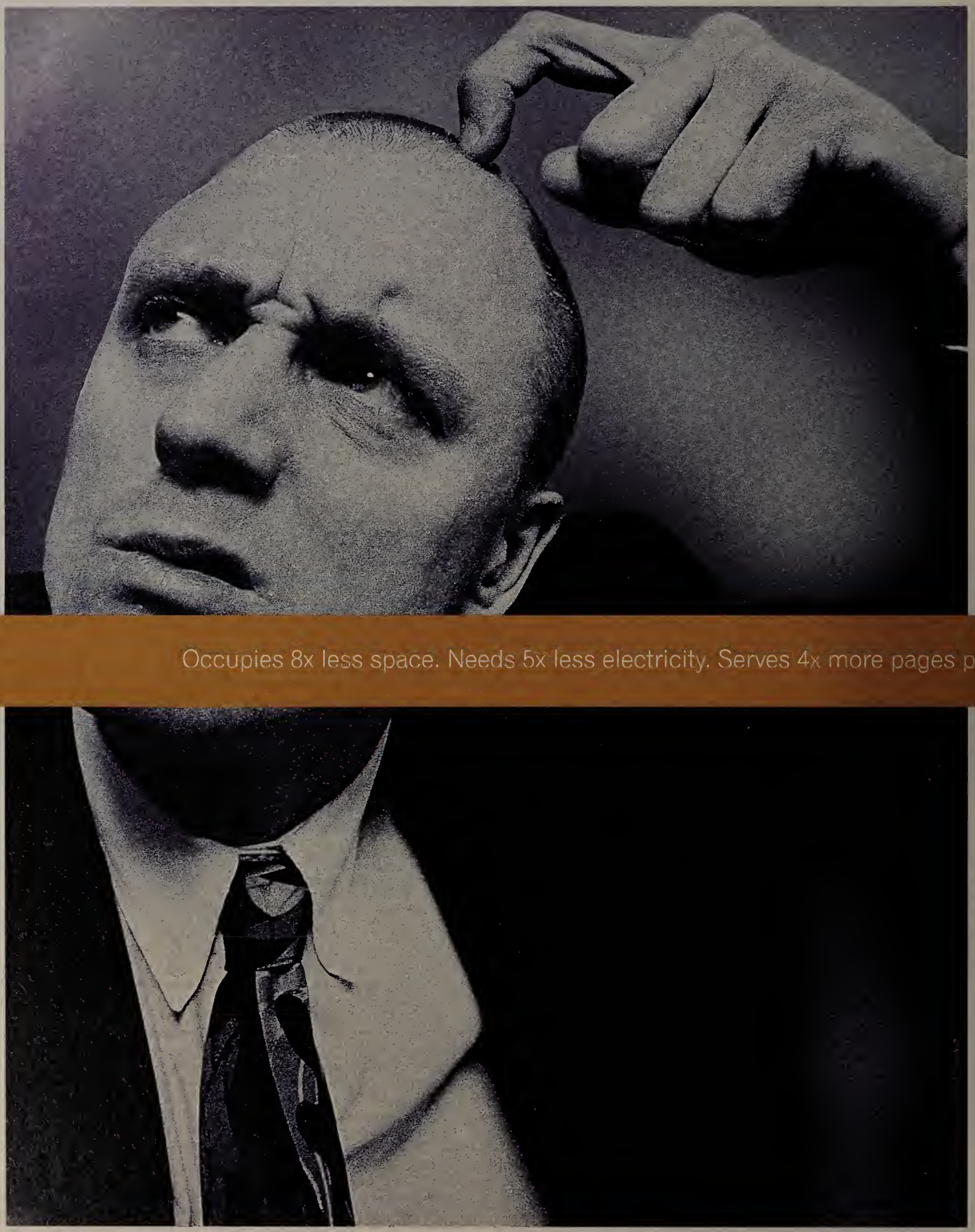
Sharer is vice president of marketing at Occam Networks. He can be reached at rsharer@occamnetworks.com.

HOW IT WORKS

Resilient Packet Ring

The Resilient Packet Ring (RPR) specification adds features to the media access control layer that is suited for running packets over ring topologies in a metropolitan-area network.





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Gearhead . inside the network machine . Mark Gibbs

REVEALING FTP SERVICES

So last week we threatened you with the truth about the "SITE" command. This command may seem innocuous — it returns information about the server. Exactly what information is returned depends on the server implementation, and the easiest way to check out what a specific FTP server will tell you is to telnet to Port 21 on the target server and issue a "SITE" command:

220 ftp.someserver.com ready. Unauthorized access prohibited.

USER ANONYMOUS

331 Guest login ok, send your complete e-mail address as password.

PASS ANON@ANON.COM

230 Guest login ok, access restrictions apply.

SITE

500 'SITE': command not understood.

This server doesn't want to tell us anything. Issuing the system type command, "SYST," will tell us what they are running:

SYST

215 UNIX Type: L8

And the status command, "STAT," will tell us about our session:

STAT

211-ftp.someserver.com FTP server status:

Version wu-2.6.0(2) Wed Feb 28 11:35:54 PST 2001

Connected to somenet.net (163.247.121.110)

Logged in anonymously

TYPE: ASCII, FORM:Nonprint; STRUcture: File; transfer MODE: Stream

No data connection

0 data bytes received in 0 files

0 data bytes transmitted in 0 files

0 data bytes total in 0 files

89 traffic bytes received in 0 transfers

1183 traffic bytes transmitted in 0 transfers

1322 traffic bytes total in 0 transfers

211 End of status

All of this really doesn't give anything away. But try the same thing on the FTP service on a Microsoft Internet Information Server (IIS) FTP system (in this case, Microsoft's):

220 CPMSFTFTPA05 Microsoft FTP Service (Version 5.0).

USER ANONYMOUS

331 Anonymous access allowed, send identity (e-mail name) as password.

PASS anon@anon.com

230-This is FTP.MICROSOFT.COM Please see the dirmap.txt

230-file for more information.

230 Anonymous user logged in.

SYST

215 Windows_NT Version 5.0

SITE STATS

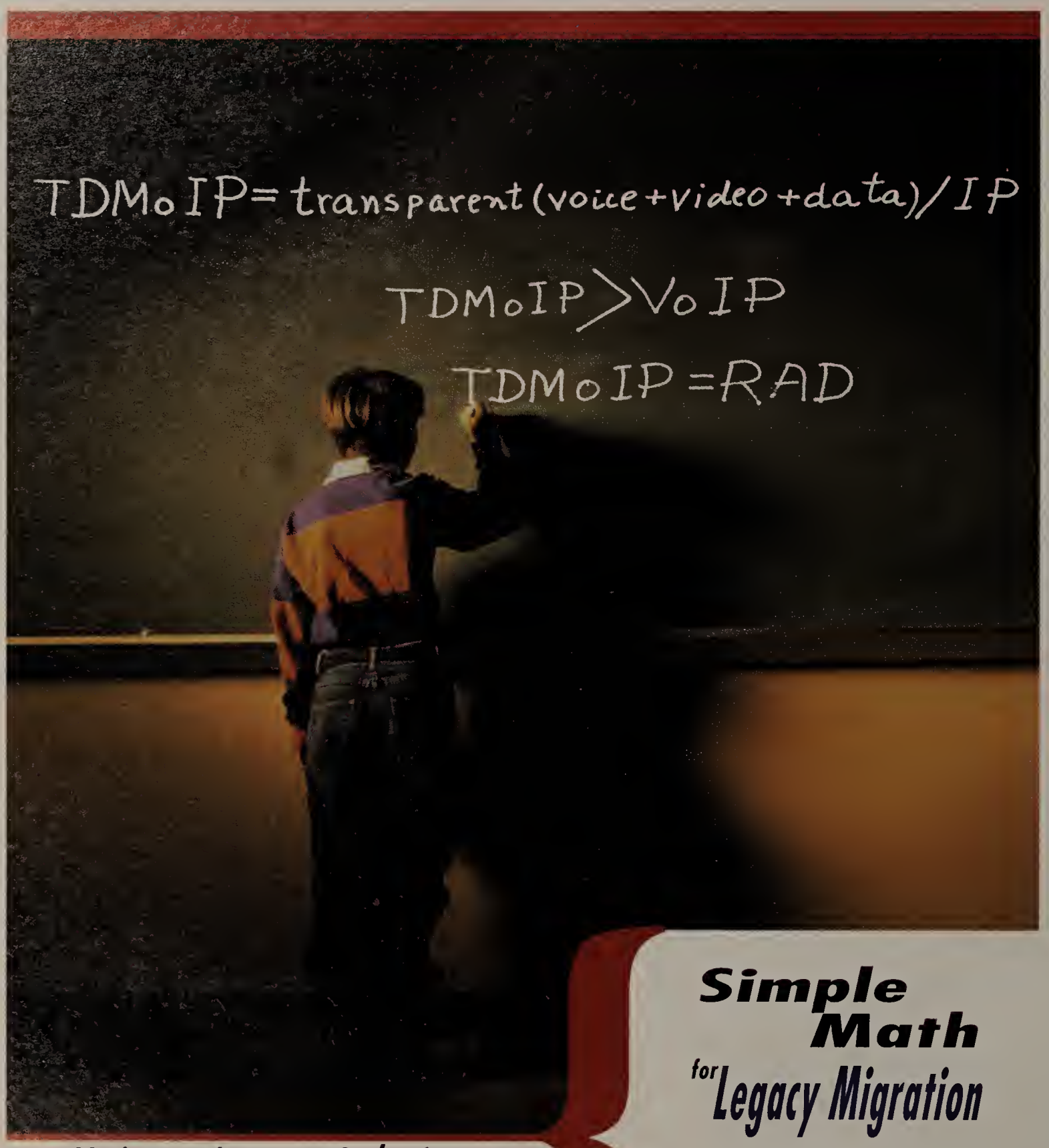
200-ABOR : 21886

(Here are a lot of stats about how many times each command was used such as more than 21,000 aborts shown above and, although we haven't shown it, there were just over 128,000 login attempts since the server started.)

200 End of stats.

Basically, these kind of data give away a lot about the site's usage. If this was a competitor of yours running IIS, wouldn't you be interested to know how many FTP logons were attempted? And if it were your site, wouldn't you want to switch off delivery of such information? Guess what? You can't. Such is and always has been IIS. Perhaps you need another brand of FTP server.

Revealing comments to gearhead@gibbs.com.



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Opinions

Editorial

Convergence hasn't lived up to the hype

Let's see, when did all the hype about convergence begin? I dug up a *Network World* story from the fall of 1997 that described how convergence was the talk of N+I.

Here we are four years later, and I think it's fair to say that convergence hasn't made much of a dent in the corporate network.



In fact, Gartner estimates that IP/PBX shipments constitute less than 2% of all PBX shipments, based on an analysis of the market in the fourth quarter of last year.

And when Miercom asked nearly 100 voice-over-IP vendors to estimate what percentage of U.S. voice traffic is traveling over an IP network at least part of the way, the vendor estimate averaged out to nearly 8%.

However, the vendors also estimated that the installed base for voice-over-IP equipment is more than 70% service provider and less than 30% enterprise, which puts enterprise-based voice-over-IP traffic in the 2% range. (See full results of the Miercom survey in our Technology Insider on page 46).

So why hasn't convergence taken off?

- According to Gartner, voice over IP was never something that customers asked for. It was a vendor idea pushed by data networking/IP-centric vendors like 3Com, Cabletron and Cisco to attack the PBX vendors.
- Until very recently, vendor products didn't scale far beyond 75 end users.
- Standards are still a mess. There's H.323, there's SIP, there's MGCP. Gartner predicts that standards won't be ironed out until 2003.
- The return on investment for voice over IP is difficult to prove.
- Voice-over-IP networks still can't beat traditional voice for breadth of features, security and reliability.
- New applications — unified messaging, Web-enabled call centers — have yet to gain traction.
- Interoperability remains a major concern.
- And quality of service was listed in the Miercom survey as an important factor in the slow rollout of voice over IP.

I visited Cisco earlier this year and was very impressed with the company's voice-over-IP network, which sports all the bells and whistles — unified messaging, voice activation, browser-equipped IP phones. So Cisco is indeed eating its own dog food. The problem seems to be that other companies aren't biting.

— Neal Weinberg
Features editor
nweinbergAutoline@nww.com

Message Queue

WHAT END USERS HATE

Having just read the story "What end users hate about you" (www.nwfusion.com, DocFinder: 5722), I find myself both agreeing and disagreeing with many of the comments expressed:

1. Geek speak — Yes, many technicians do talk way above the typical end user's head. On the other hand, many IT people expect end users to have a modicum of knowledge about computers. I can't even guess at the number of times I've heard "my CPU won't turn on" when it's really the monitor the user is talking about.

2. Customer disservice — We in IT do understand that without end users bringing in business, we would not have jobs. But many end users fail to grasp that without the tools we provide, they would be unable to get those customers. All departments need to be seen as equally important for an organization to function properly. As for the "they are too important to ever answer their phone" comment, far too often I've run into people who would rather have a "personal technician" handle all of their problems so they never had to call the help desk. Bottom line: If we didn't ask for a direct call, then call the help desk.

3. Service interruptus — Most organizations use a help desk software package with the understanding that the techs are responsible for updating the information in each ticket. Unfortunately, this does not always happen and the manager of that tech should reprimand the tech, or discipline the tech if it is a repeat offense.

4. Covert missions — Admittedly not all correspondence from IT is as informative as it should be. On the other hand, users need to remember we deal with a large population of users with varying levels of computer knowledge and so have to work at the lowest common denominator.

5. Impatience — IT people know that users sometimes don't follow instructions and repeat mistakes. All we ask is that if we tell you not to do something, then don't do it. We try to have patience, but when faced with the "user-who-just-won't-listen," we tend to become frustrated.

6. Inability to admit defeat — Valid point. Many techs would rather leave the job half-done than (in their minds) lose face in front of end users. Also, techs sometimes live in fear of being labeled as unknowledgeable and losing their jobs because some user doesn't like the "let me research this problem I've never seen before" answer and complains to the tech's boss.

7. Inflexibility — The reasoning behind this complaint can be sound in most instances. The reasons are usually: 1) the user has no business modifying the machine because it is set to do everything the user needs to do; and 2) our techs need a standard to work from because we can't afford to train them in (literally) millions of software packages.

8. Slow on the uptake — IT people should fix things as quickly as possible. "Possible" includes the time it takes for IT to be notified there is a problem. If you don't tell IT about the problem for days (or weeks or months), then don't expect us to fix it. Also realize that a quick workaround fix is not always possible.

Bill Prentice
Winston-Salem, N.C.

The common theme of "What end users hate about you" is miscommunication between the various parties. One way my company has attempted to combat this is by having dedicated IT staff assigned to specific business areas so that all the players get to know and understand one another. This has worked well in most situations.

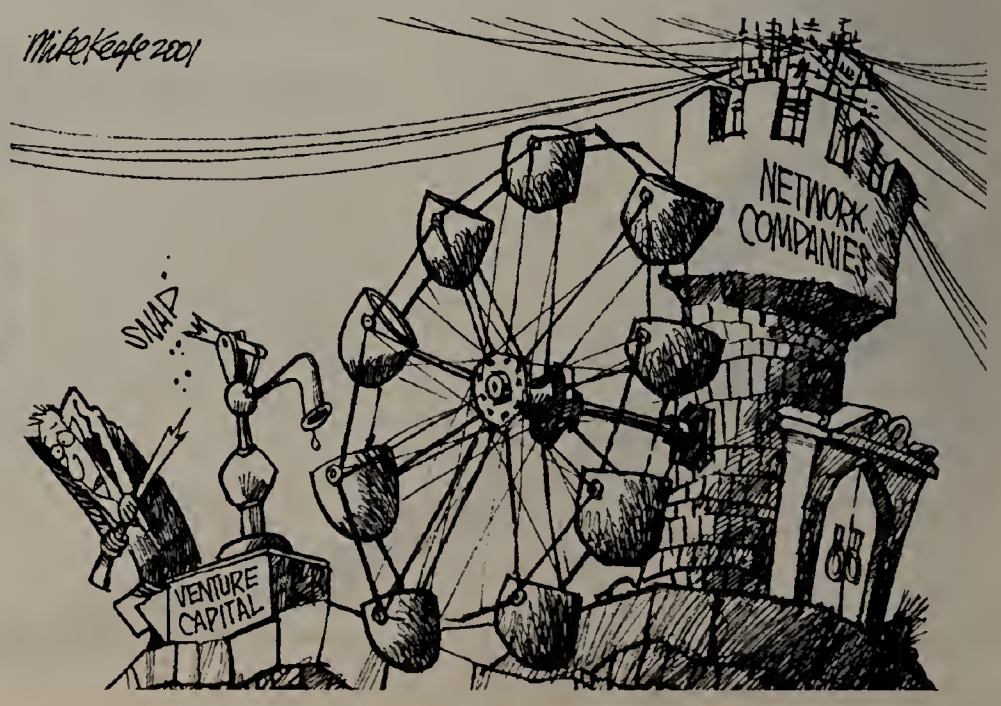
Mack Curle
Richmond, Va.

Too bad "What end users hate about you" doesn't contain some examples of how good management and departments do it right. My company's IT group is outstanding and very responsive. They also run a help desk that answers all questions, no matter how small.

Phil Roy
Director, solution center
Agile Software
San Jose

Send letters to nwnews@nww.com or John Dix, editor in chief, Network World, *118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.*

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Venture Over the Horizon . Kevin Fong

THE DATA CENTER TAKES CENTER STAGE

The future of the data center is a hot topic among the people I talk to these days. Several issues stand out whenever these discussions occur. One area that elicits a great deal of interest is the problem of latency in the network as it relates to retrieving data from storage. Another centers on the skyrocketing costs of network administration and management. The effect of introducing distributed applications built on Internet standards, and the challenge of growing the data center to meet the demands of more users, is also a much-debated topic. The question of how the future data center will develop concerns both internal enterprise data centers and external service providers that house applications and data centers for other companies.

A number of factors are driving this focus on the data center. Since the mid-1990s, data have been created at an unprecedented rate. At the same time, the cost of storage has dropped dramatically. As a result, rather than being relegated to the edge of the enterprise as it was in the past, data have moved to the center. The enterprise data center has always performed important processing functions, such as online transaction processing and batch processing. But now, the sheer volume of data that can now be stored has implications not only for what can be done with the data, but also with the very architecture of the data center itself.



It is no longer enough to continually add servers as demand grows. As more intelligence evolves to the routers and storage networks, the functionality of servers decreases. At the same time, any network involved in the data center must have the same quality of service, scalability and reliability as a telecommunications network, particularly if it is attached to the public network. The challenges then involve how to move data out of storage, classify them and design applications that create value-added opportunities.

The venture community is excited about the opportunities these challenges present to fundamentally rearchitect the data center. Start-ups such as 3PARdata (a Mayfield investment), Yotta Yotta and Cereva Networks are developing storage systems specifically for shared data centers. Desana Systems (another Mayfield investment) is developing high-performance hardware and intelligent software to enable the rapid delivery of customized application services from the data center. Mayfield has also invested in digiMine, which provides data warehouse and data mining services.

Companies have expressed an avid interest in retooling their data centers to make them more information-centric. This must be done with a careful eye on network administration and network management costs. New services must not only be easy to deploy but also must not add substantially to the overall cost. When that balance is struck, data centers can be powerful generators of new services and revenue.

Fong is a managing general partner with Mayfield, a venture capital firm in Menlo Park, Calif. He can be reached at kfong@mayfield.com.

On Security . Winn Schwartau

TO HELL WITH PROPRIETARY ENCRYPTION ALGORITHMS

I sat in the front seat of a Mustang convertible, next to the driver. In the back seat sat The Third Man, who was demonstrating how easy it is to break into a wireless network using a laptop, Global Positioning System, wireless LAN card and free downloadable software.

We drove around Las Vegas the day before DefCon and found an endless supply of wireless networks. How do you break in? Reboot your computer, the wireless access point sees you, Dynamic Host Configuration Protocol assigns you an IP number, and you're a remote wireless node on the net.



In only two cases did we find networks that use the Wired Equivalent Privacy (WEP) algorithm. WEP is fundamentally useless because the 26-bit algorithm can be routinely cracked in less than four hours, again using downloadable tools. Why anyone would use wireless nets is beyond me, especially knowing that a break and enter is as simple as firing up Windows from a car or the nearest McDonald's.

So I talked to folks who live and breathe breaking through security and encryption. RSA Security just announced a $200,000 prize for the crypto-geek who can successfully factor impossibly large numbers. That reminded me that the older and weaker RC-4 algorithm was cracked by a distributed processing assault.

During the last decade, companies have routinely tried to crack proprietary cryptography. Visit www.elcomsoft.com for a host of products whose sole goal is to crack password protection on Microsoft and other major products — ostensibly to recover lost corporate files. Search for "password crackers" and you'll find every kind imaginable. The cryptography in Lotus Notes is another victim of aggressive and successful crypto-hacking. And things only get worse from there.

It turns out that major mission-critical, enterprise-wide software packages are just as vulnerable to crypto-hacks. Imagine if you found that your entire database was not really protected by "strong proprietary encryption algorithms," as the vendor claimed; or that your payroll system's password security was similarly vulnerable because the vendor figured it could out-design the best cryptographers in the world.

Later this year, a group of security professionals plans to release a study naming some top enterprise applications with screamingly weak cryptographic implementations. They are especially focusing on embedded cryptographic security for database applications.

This study will provide enough evidence of how weak these "strong proprietary cryptographic algorithms" are. But the authors will stop one step short of releasing the step-by-step methodology on how to crack them. The goal is to get vendors to 'fess up to their crypto-errors and then repair the hundreds of thousands of vulnerable systems deployed worldwide. No matter; soon enough hacks such as these become public knowledge, to the benefit of malicious insiders and external attackers.

I don't get it. As an industry, we have some pretty good cryptography out there. Whence comes the arrogance that applications vendors can do a better job than the best mathematicians and trained cryptographers the National Security Agency, Government Communications Headquarters and academia can muster?

We have the Data Encryption Standard (DES), which still provides a free and reasonably good, well-tested means of protection. Triple-DES, which is good enough for the banking community, is also free and thoroughly understood. The new Advanced Encryption Standard will take us a "guesstimated" 20 years forward, and RSA and Network Associates have stables of proven cryptographic methods. What's with this proprietary stuff?

Developing the best cryptographic algorithm is a battle the commercial software vendor should not enter. With the incredibly complicated mathematics, expensive and advanced technologies, and limited set of skilled humans, vendors are best suited to implement well-known, open source, tested and accepted cryptographic approaches.

My advice to user companies is to use approved and well-known public algorithms, not proprietary ones. Implement cryptography carefully, making key management your focus. Use trusted third parties for testing and evaluation.

If your vendor uses a proprietary algorithm for anything you want to protect, such as data and passwords, run. If your vendor claims that the proprietary algorithm is secret, run. If your vendor won't show you or the cryptographic community the engine that makes its cryptography so great, run.

Vendors: Stick to your strong suit, your business application. Hire proper crypto-geeks and let them do the job right. The alternative, as we may see in the coming months, may be terribly painful.

Schwartau is president of Interpact (www.interpactinc.com), a security-awareness consulting firm, and author of many books, including CyberShock *and* Internet and Computer Ethics for Kids *(www.nicekids.net). He can be reached at winn@interpactinc.com.*



VoI vend

On this page, the first public test of the SIP protocol, vendors demonstrate that their products do work together . . . for the most part.

The convergence of voice and data networks isn't happening as fast as vendors would like. In our exclusive survey of nearly 100 VoIP vendors, we uncover the key reasons why customers remain leery of VoIP.
Page 52.

BY BETSY YOCOM, KENNETH PERCY AND UWE BILGER

In the first public test of Session Initiation Protocol — the challenger to the more established H.323 standard for voice-over-IP call control -- vendors proved they could achieve basic interoperability with minimal tweaking.

But interoperability at more advanced levels proved more daunting. Only four products -- Cisco AS5350 Universal Gateway, Indigo Software Proxy Server, Mediatrix APA III-4FXS and SS8 Networks Signaling Switch -- achieved basic and advanced interoperability on all levels.

We found that some of the less mature SIP implementations lacked support for certain SIP commands, while some vendors didn't support advanced functions such as sequential and parallel forking and fax support. Some vendors chose not to participate in advanced tests, which were optional, because they didn't support the function or because their implementation wasn't ready for prime time.

The open SIP interoperability event was held at Miercom's test facility in New Jersey. A dozen vendors (including RADCom, which provided test equipment) offering 18 products participated. Vendors were asked to prove basic interoperability with two reference products — Pingtel's xpressa SIP phones, acting as SIP user agents, and the dynamicsoft Session Management Suite (SMS), a SIP proxy server.

JACEY

IP

ors pass SIP test



Devices based on Session Initiation Protocol offer basic interoperability, but challenges remain for advanced features.

Basic interoperability: User agents

Products tested: Cisco (two products), CyberTel, Difinium, Indigo Software and Mediatrix.

Definition: A SIP user agent is a SIP-enabled end-user device, which could be a phone, a PC, a cell phone or a unified messaging system. SIP supports setting up and tearing down media sessions between user agents, such as "invite" and "ack" (acknowledge).

Test: Vendors had to successfully demonstrate their products could place calls from one user agent to another (and vice versa) and hang up the call.

Basic interoperability: Proxy servers

Products tested: Indigo Software, Mockingbird Networks, NetCentrex, SS8 and Vovida.org.

Definition: A SIP proxy server receives SIP messages from user agents and acts on their behalf in forwarding or responding to those messages. Their function is not unlike a gatekeeper or call agent in other voice-over-IP environments. Also, proxy servers add services, features and scalability to SIP networks. The SIP proxy server typically includes a registration service and a SIP location database, in addition to the SIP proxy.

Test: SIP proxy servers had to demonstrate the ability to interoperate with user agents in a single SIP domain; with other SIP proxy servers in a multiple-hop network; and with public switched telephone network (PSTN) gateways in user agent-to-analog phone tests.

Basic interoperability: PSTN gateways

Products tested: Cisco, Mediatrix, Mockingbird Networks and Nuera.

Definition: SIP-based public switched telephone network gateways provide the interface between a SIP-based voice-over-IP network and the PSTN.

Test: The SIP-based gateways had to demonstrate the ability to process SIP calls to the PSTN; interoperate with other gateways in a multiple-hop network (SIP/IP trunking); and interoperate with gateways via ISDN (primary rate interface) trunking. (An Adtran Atlas 800 central-office switch and a Carrier Access channel bank were used to switch analog calls and trunks.)

Results for all basic interoperability tests

All vendors demonstrated basic interoperability with the Pingtel xpressa user agent and the dynamicsoft SMS SIP proxy server (see graphic next page).

However, this was typically not achieved out of the box. Some tweaking of code and other technology parameters was usually necessary. For example, during the prestaging, a few vendors had to change their SIP "invite" responses to operate with the Pingtel xpressa phones. Others had to load newer versions of their software to achieve the desired results.

Most vendors were testing with Version 3 of SIP, which was published in May. Differences in interpretations of the specification did arise, and in a few instances we noted backward-compatibility issues between vendors using an older version of SIP and vendors using Version 3. (SIP is supposed to be fully backward compatible with older versions.)

One problem concerned an outdated requirement on a user agent, which user agents based on the newer version of SIP did not recognize. When this requirement was off-loaded to a SIP proxy, interoperability between the user agents was achieved.

Two notable issues concerned lack of support of the SIP "options" request and problems with the SIP "record-route" command on some products.

An options request is comparable to a handshake in which SIP endpoints communicate what parameters are supported end to end and whether the called device is available to accept calls. While it did not interfere with their ability to interoperate functionally, many of the products tested did not support the options request or else implemented it incorrectly.

Problems with the record-route function, which was supported on the dynamicsoft reference proxy server, had a bigger impact. A record-route header is used to indicate routing between two user agents through a proxy server. Operating in record-route mode is important to maintaining "stateful" operation, in which the proxy maintains all subsequent signaling on that call. This signaling includes call detail recording information (used for billing) and firewall control, which are important network functions. Incorrect working of record-route could also prevent proper closing of a call.

According to dynamicsoft, some vendors do not now adequately support record-route because SIP lets you conduct an interoperable user-agent-to-user-agent connection without using a proxy server. A great deal of development is under way in the user-agent-to-user-agent environment, where record-route isn't an issue. It becomes more important, however, in larger networks that deploy SIP proxy servers.

We also assessed the quality of voice calls, which, while not part of SIP conformance interoperability testing, is important from a functional perspective. All vendors demonstrated "toll quality" connections — assessed by Miercom engineers, based on a mean opinion scoring of 1 (poor) to 5 (excellent). A toll-quality call was rated 4 or above.

Interoperability with each other

After completing basic interoperability tests with the reference platforms, the vendors participated in a free-style event in which they attempted basic interoperability with each other. (These results are shown in Table 2 on Network World Fusion, www.nwfusion.com, DocFinder: 5723.) Intervendor interoperability, again, was widespread although not at 100%.

Advanced interoperability

Four participating vendors — Cisco (via its AS5350 Universal Gateway), Indigo Software (via its Proxy Server), SS8 Networks (via its Signaling Switch) and Mediatrix via its APA III-4FXS — achieved basic and advanced interoperability on all levels.

Cisco could make the same claim for its ATA-186 Telephony Adapter and 7960 SIP phones, too. However, because neither supports call forwarding, that feature could not be tested at the advanced level. (Cisco supports call forwarding on its proxy server, not the user agent.)

Problems at the advanced levels concerned inadequate handling of sequential and parallel forking on the SIP proxies; and codec negotiation and fax support on



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the gateways. "Forking" is when a proxy server sends an "invite" request to more than one location.

We found: Three out of five SIP proxies (Indigo Software, Mockingbird Networks and SS8 Networks) successfully handled sequential forking. A call was transferred by the reference proxy and subsequently rung on three different user agents in sequence — a function that is necessary to successfully deliver "find-me/follow-me" support.

- Only two out of five proxies (Indigo Software's and SS8 Networks') successfully demonstrated parallel forking. A call was transferred from the proxy to three different user agents — all at the same time. This feature is employed when a user wants calls to ring, for instance, on a cell phone, business phone and PC at the same time.
- We also encountered some problems with codec negotiation. In one instance, a vendor's user agent expected to receive a codec list in all upper case. And when it was received in lower case from the Pingtel reference user agent, the call was set up, but a voice-over-IP media stream was not sent.
- Fax support based on the T.38 specification was another issue. Cisco and Nuera demonstrated faxing based on pulse-code modulation, but no vendor successfully demonstrated interoperability based on the ITU-T's newer T.38 fax-encoding specification. Cisco and Mediatrix claim support for T.38, but they did not test it for interoperability. Problems with T.38 fax interoperability, however, are reportedly more often related to the codec implementation than to SIP call-control signaling. SIP defines only the signaling messages, and allows anything, including voice, fax or video, to go into the body of the message.

Conclusion

We found that SIP-based basic interoperability works, and works well. SIP is a relative youngster compared with the ITU's H.323 specification for voice-over-IP call control, and to achieve this level of interoperability so quickly via SIP is impressive.

But there's work to be done on the more advanced functions, and it's apparent that some conformance issues remain to be solved. Still, users can expect rapid development on SIP-based advanced functions as the business cases for implementing SIP become more pervasive.

Yocom is senior editor, Percy is technology analyst and Bilger is senior lab-test engineer at Miercom, an independent testing lab located in Princeton Junction, N.J. They can be reached at byocom@mier.com; kpercy@mier.com and ubilger@mier.com.

SIP interoperability

We tested interoperability between vendor products and two "reference" products — a Pingtel xpressa SIP phone (user agent, or UA) and a dynamicsoft Session Management Suite SIP proxy server. The basic tests were mandatory; the advanced tests were optional.

Product	Basic Interoperability	Advanced Interoperability			
SIP user agents	• UA-to-UA direct call, no proxy server • UA-to-UA, through SIP proxy server • UA-to-analog-phone, through SIP proxy server	Call transfer	Conference calling	Call forwarding	
Cisco ATA-186 telephony adapter	● ● ●	●	●	●	
Cisco 7960 SIP phone	● ● ●	●	●	●	
Difinium Mercury	● ● ●	●	●	●	
Indigo Software SIP User Agent	● ● ●	●	●	●	
Mediatrix APA III-4FXS	● ● ●	●	●	●	
CyberTel CyberCom Server Class	● ● ●	●	●	●	
SIP proxy servers	• UA-to-UA, through reference SIP proxy server • UA-to-UA, through multiple SIP proxy servers • UA-to-analog phone, through SIP-based PSTN gateways	Transport negotiation	Sequential forking	Parallel forking	Loop detection
Indigo Proxy Server	● ● ●	●	●	●	●
Mockingbird SIP server	● ● ●	●	●	●	●
NetCentrix call control server	● ● ●	●	●	●	●
SS8 Signaling Switch	● ● ●	●	●	●	●
Vovida.org Vocal	● ● ●	●	●	●	●
SIP-to-PSTN gateways	• UA-to-analog phone, through SIP proxy server • SIP/IP trunking, analog phone through PSTN gateways • PRI trunking, UA to UA through PSTN gateways	Codec negotiation	Transport negotiation (TCP-UDP)	Fax support	Reinvite method support
Cisco AS5350 Universal Gateway	● ● ●	●	●	●	●
Mediatrix APA III-4FXO	● ● ●	●	●	●	●
Mockingbird Nuvostream multiprotocol server	● ● ●	●	●	●	●
Nuera ORCA GX-8	● ● ●	●	●	●	●

KEY ● Successful interoperability ● Not tested ● Not supported

Jumping through loops

On the Session Initiation Protocol proxies, we also tested the ability to handle spiral loops, which are necessary to move a call through several forwardings, including from one domain to another, without losing it. Only Indigo Software and Mockingbird Networks attempted the tests. However, differences in opinion among vendors about the proper outcome precluded a clear resolution of this interoperability test. Mockingbird and Indigo Software cited ambiguities in the SIP specification and the test methodology.

Open-door policy

This was the first public Session Initiation Protocol event. Previous SIP interoperability forums have been closed-door sessions in which vendors have tested conformance of their products with SIP and ironed out various issues relative to interpretation of the SIP specification.

This public on-the-record event (co-sponsored by Miercom, a Network World Global Test Alliance partner, and Network World) was designed to test basic interoperability on a functional level. We sought to find if SIP-based products could place calls, achieve an adequate level of voice quality, and hang up.

Vendors that Miercom's research determined were implementing SIP within their voice-over-IP products were invited to participate. Ground rules for the event established that vendors would have three days of prestaging to iron out any kinks before going on the record with results.

Miercom agreed that issues identified and ironed out during the prestage would not be a part of the public record, although we would assess and discuss the nature and scope of these problems. Any vendor that could not successfully establish basic interoperability after the three-day preliminary period was free to leave before the public event took place. No one did. And so, everything that followed was on the record.

Participating vendors were asked to prove basic interoperability with two reference products — Pingtel's xpressa SIP phones, acting as SIP user agents, and the dynamicsoft Session Management Suite (SMS), a prominent SIP proxy server. These products were chosen based on two criteria: our research showed that they were widely regarded as among the most mature SIP implementations of their type currently available; and interviews with other vendors and end users indicated that these products would be the most likely to interoperate with other vendors' equipment.

Testing was based on the IETF's SIP RFC 2543bis-03 (Version 3 of the SIP specification, which was an Internet draft at the time). (For complete details on this specification, see www.ietf.org). Three basic types of voice-over-IP equipment were represented: SIP user agents, SIP proxy servers and SIP-based public switched telephone network gateways.

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The enterprise VoIP UPDATE

Survey says deployment is being slowed by too many standards, not enough interoperability and concerns over quality of service.

BY EDWIN MIER, NETWORK WORLD GLOBAL TEST ALLIANCE

Voice over IP isn't making much of an impact in companies just yet, but deployments are expected to pick up considerably in the next two years, according to the results of an exclusive Miercom/Network World survey of nearly 100 voice-over-IP equipment vendors.

To get a sense of where the voice-over-IP market is and where it's headed, Miercom received detailed responses from 96 voice-over-IP equipment vendors including 3Com, Altigen, Avaya, Cisco, Clarent, ECI Telecom, Ericsson, Lucent, Motorola, Nortel, Nuera, Shoreline, Siemens and Sphere.

When asked how much of the total U.S. voice traffic is traveling over IP, the vendors estimated that nearly 8% of all calls today travel at least part of the way on an IP network. They also estimate that the voice-over-IP installed base today is more than 70% carriers and ISPs, and less than 30% enterprise networks. That means voice over IP in the enterprise represents closer to 2% of total U.S. voice traffic.

Vendors are painting a rosy picture of the future, however. They predict that in five years more than 36% of U.S. phone calls will be voice-over-IP-based. And most predict the imbalance between service provider deployments and enterprise deployments will begin to level out over the next two years. Fifty-five percent say they believed voice-over-IP port shipments over the next two years will be closer to a 50/50 split.

Protocol proliferation

On the issue of standards, we found that Version 2 of the ITU-T's H.323 specification still reigns as the most commonly implemented voice-over-IP call-control standard. But that is likely to change in the next year.

While few respondents say they are planning to add H.323 Version 2 support (as nearly three-fourths say they already do), more than half plan to add support for the latest version of the IETF Session Initiation Protocol (SIP) and/or the ITU-T's new H.248 voice-over-IP call-control standard (see graphic, right).

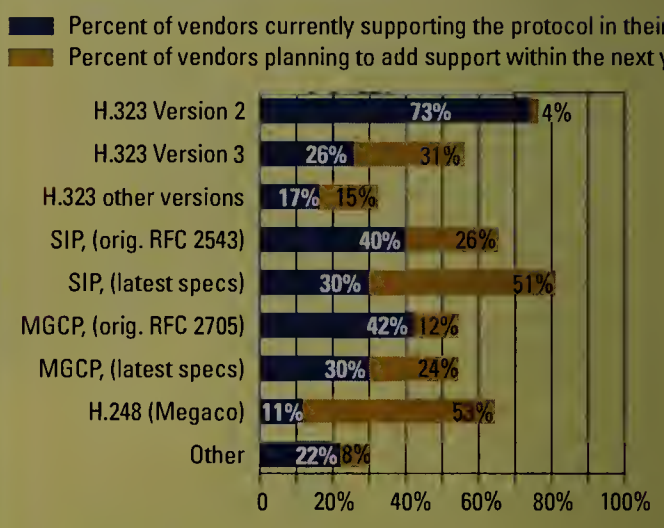
With 30% of vendors claiming to already support SIP, and 51% more planning to add SIP support, more than 81% of the industry could be supporting SIP by next summer.

Media gateway control protocol (MGCP) support, which seemed neck and neck with SIP support just a few months ago, appears to have lost some momentum. About half of the voice-over-IP vendors say they expect to be supporting MGCP by next year.

The choice of which control protocol to implement is key for different vendors' voice-over-IP gear to be able to interoperate. And this proliferation of protocols does not bode well for ubiquitous voice-over-IP interoperability any-

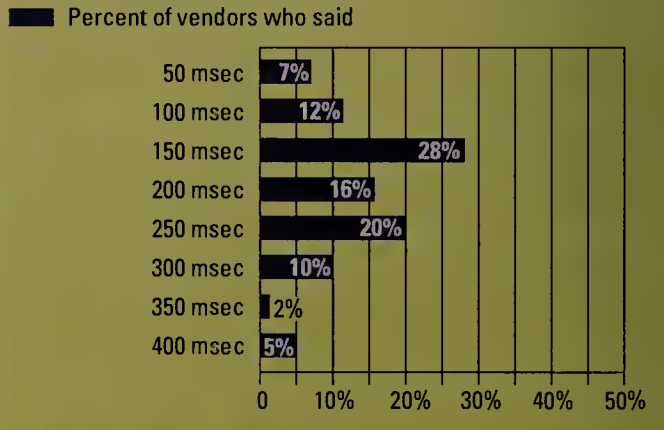
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The changing VoIP landscape



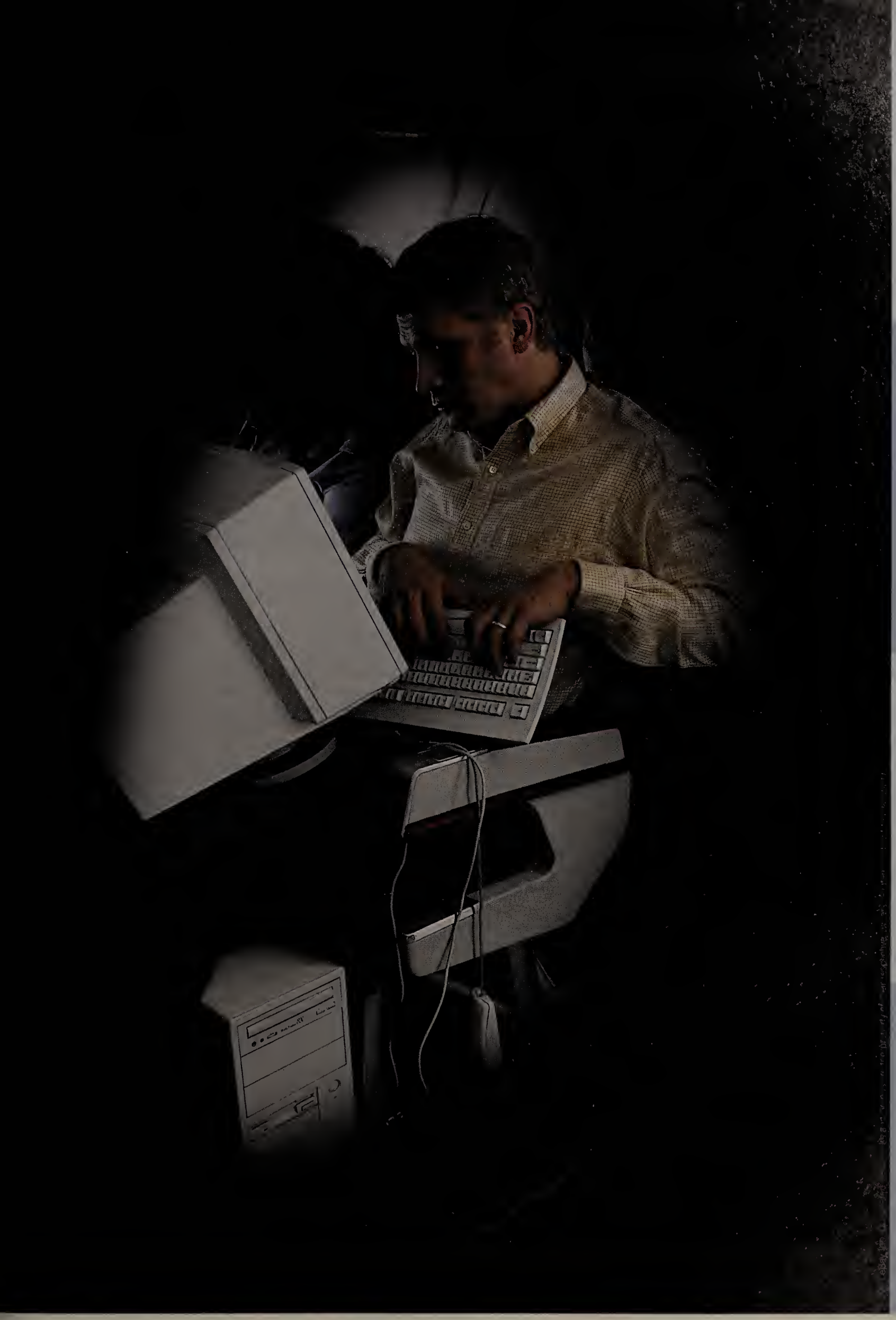
How much delay is acceptable?

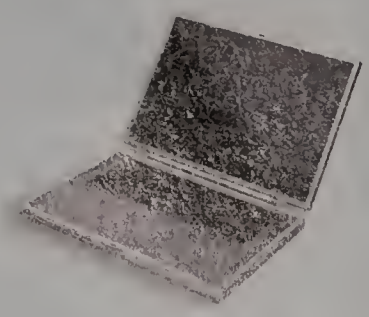
"In your opinion, what is the maximum end-to-end, one-way latency that is acceptable to 'most' people for real-time voice communications?"



SOURCE: MIER COMMUNICATIONS







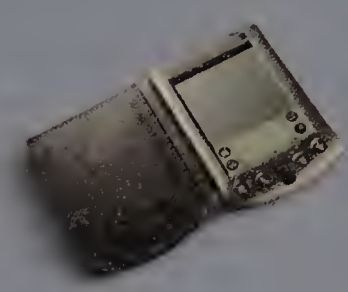
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Continued from page 52

time soon. We note, too, that most of these protocols represent very large and complex software implementations, where interoperability between vendors is measured in degrees.

Interoperability issues

We asked if two vendors' systems running the same standard protocol would interoperate. The chances are only about one in three that two systems would interoperate today "to a fair extent," functionally speaking, out of the box. That's not very reassuring to users.

The chances are improved to better than one in two, however, that some technical jury-rigging would allow them to interwork to a fair extent. The vendors optimistically project that in two years the chances that two systems will interoperate to a fair extent "out of the box" rises to two out of three.

Are today's leading voice-over-IP protocols the ones that will be the basis for interoperability in two years, or will still more new voice-over-IP protocols be needed? There are enough already — 80% of respondents say interoperability in two years will be based on today's protocols.

Is a two-year timetable toward interoperability reasonable? The vendors were asked: In what year do you expect most voice-over-IP equipment (greater than 50%) will be generally interoperable? The clear majority of them, nearly 70%, were split over whether this would occur in 2002 or 2003. That should help users who are tying their voice-over-IP purchase plans to the advent of interoperability.

We also asked vendors to name the main factors frustrating interoperability. The most cited factor, by 54% of respondents, is too many standards. The next most prevalent response, by 53%, is that marketplace pressure for product differentiation — that is, unique features and capabilities — is making interoperability difficult. Two other leading causes, both cited by 49% of respondents, are: "Certain leading vendors are not serious about interoperability," and "the voice-over-IP standards are too complex."

Latency is key

We also asked the respondents, most of them product managers, several questions about voice-over-IP performance and voice-over-IP voice quality. The most significant factor affecting voice quality is latency. As a follow-up question, we asked the respondents what they thought the maximum one-way, end-to-end latency acceptable to most people was (see chart, previous page).

In years of testing, we have found most people will begin to notice latency, even begin to be annoyed by it, as it rises above 150 msec. While 28% of respondents agree that 150 msec is the high end of most people's latency tolerance, one-third of respondents say that delays up to 250 msec are tolerable by most people.

At that point, which is akin to the latency of a voice call sent via a high-orbit geosynchronous satellite, callers would certainly be aware of the delay and probably also be annoyed by it. Clearly some vendors think consumers are willing to routinely accept anomalous voice-over-IP voice quality, presumably as a trade-off to other factors, such as low costs for phone calls.

Pros and cons

We asked the vendors to name the main factors that promote and propel voice over IP, as well as the main factors that inhibit or impede voice over IP's acceptance. In each case we offered a half-dozen check-box responses, plus space to write in "other" reasons (see chart, left).

Clearly the ability to move voice and data onto the same transport network is the most prevalent factor favoring and promoting voice over IP. Other sales points are derived from the consolidation of voice- and data-network management, and cost savings by reducing transport costs. Another major factor promoting voice over IP is that it enables new services, features and capabilities. Examples include unified voice and e-mail messaging, and various computer-telephony integration applications.

The main factors inhibiting voice-over-IP dominance are more varied. Lack of interoperability and the dearth of voice-over-IP expertise are two important factors — affecting availability of trained staff and even customer education. Too many standards and technological complexity were other leading reasons. The most prevalent write-in response was that lack of ubiquitous quality of service (QoS) continues to delay voice-over-IP deployment. Others cite the relative immaturity of voice-over-IP-based advanced features and functions, as well as large-scale performance and scalability.

Conclusion

Based on the survey responses, there is general agreement on several key trends regarding voice over IP. For one, most gear has been deployed by carriers and service providers, but shipments to corporations over the next two years are expected to balance that out. Also, as much as 8% of U.S. phone calls today are being carried to some extent in voice-over-IP form, and that will rise to a projected 36% in five years.

Interoperability, stymied by too many competing, complex protocols, should improve considerably within the next two years, the respondents agree. They note, too, that widespread QoS deployment needs to occur, and nifty new voice-over-IP features, functions and applications need to proliferate.

Mier is founder of Miercom, a network consultancy and product test center in Princeton Junction, N.J. He can be reached at ed@mier.com.

Miercom is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

Conduct of survey

On June 1 Miercom, in collaboration with *Network World*, launched its third annual survey of the voice-over-IP industry. This article represents an exclusive first look at the results of the data garnered by that survey. The first Miercom voice-over-IP survey, conducted in 1999, was delivered via a mix of e-mail, regular mail and fax.

This year's survey was distributed to 336 addressees, more than twice as many as last year's. All of these were believed to be suppliers of voice-over-IP products in some form. We eliminated responses from companies that, it turned out, did not produce voice-over-IP hardware or software — including service providers and resellers. We ended up with 96 valid responses, which we estimate represents about 40% to 45% of the entire voice-over-IP vendor community.

We asked respondents what specific categories of voice-over-IP product they offered (multiple category selections were allowed). The top categories in which respondents offer products are voice-over-IP gateways (57%), voice-over-IP call controllers (47%), IP PBXs (37%), software for end users (32%), IP phones (26%), software for developers/integrators (20%), integrated access devices (18%), board-level products/components (11%) and voice-over-IP-oriented test equipment (7%).

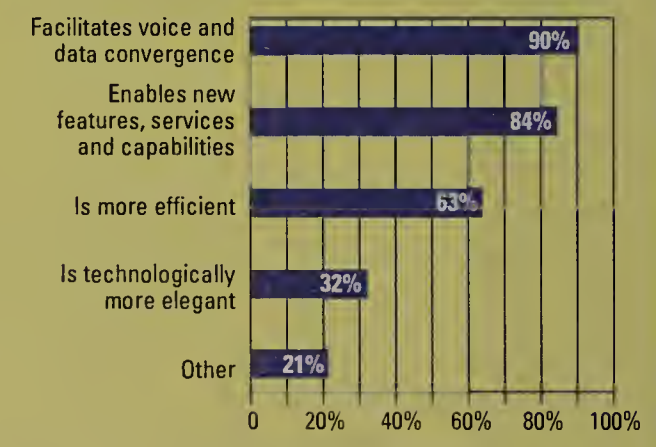
We also asked whether the vendor sold mainly to carriers and service providers, to enterprise customers, to both of these markets without distinction, or to value-added resellers (VAR) and system integrators. Forty-five percent said they sold mainly to carriers and service providers, while 19% said they sold mainly to corporations and end users. Thirteen percent said they sold to both markets without distinction, while 11% said they sold mainly to VARs and system integrators.

All respondents could have checked a box on the survey form requesting anonymity, indicating they did not wish to be identified as the source of their particular responses. Several did check this option, and their anonymity wishes have been honored.

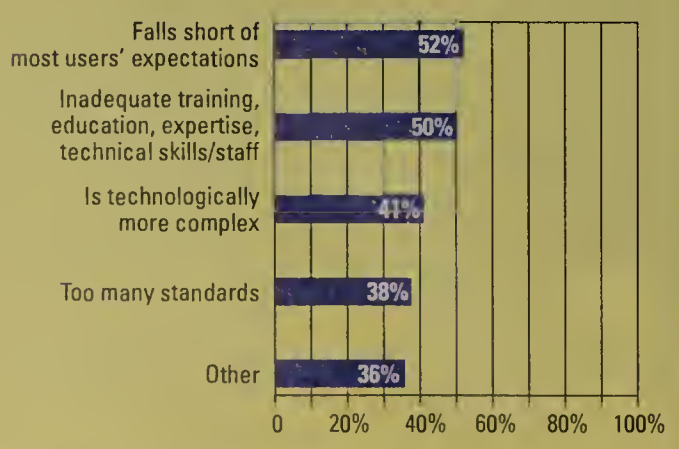
A series of follow-up surveys were also conducted for more in-depth analyses of specific product categories, including gateways, call controllers and IP PBXs.

VoIP pros and cons

Main factors driving VoIP, by percent of respondents:



Main issues inhibiting VoIP, by percent of respondents:



SOURCE: MIER COMMUNICATIONS

NetworkWorld REVIEW Security

Get a positive ID on DDoS attackers

Mazu's TrafficMaster Inspector a good first step in identifying DDoS attacks.

BY MANDY ANDRESS

Before Code Red, there was distributed denial of service. While distributed DoS attacks have not been the attack du jour as of late, they are still a strong threat to any network, providing the ability to cripple even the highest-bandwidth providers. Distributed DoS attacks are so threatening because they are difficult to identify.

Once identified, it is just as difficult to defend against them. Traffic filters are the best solution, but they must be manually implemented and they often also block legitimate network traffic. The distributed nature of the attack makes prevention virtually impossible because you never know where the next attack will come from.

Mazu Networks' TrafficMaster Inspector helps solve some of these problems by providing a way to identify distributed DoS attacks in real time on large, high-speed networks.

While Inspector identifies distributed DoS attacks, it does not provide any assistance in filtering the identified attacks. (Mazu Networks' Enforcer gateway, due later this summer, will provide this capability.)

Inspector resides upstream at the core of the network infrastructure and passively observes all traffic entering or leaving the network. It can reside anywhere on the network, but works best near the first-level routers, where it can directly monitor traffic to and from the Internet.

Inspector connects to the data path via a passive optical or copper splitter, which introduces no latency into the network and performs detailed analysis in real time. Other distributed DoS solutions (from companies such as Asta Networks and Arbor Networks) receive a sample of network traffic from routers for analysis. Inspector sits directly on the network connection and monitors all traffic, independent of the network routers for packet information. One reason Mazu's solution is so expensive ($100,000) is that the company had to develop a product that truly supported gigabit traffic levels.

Off to a good start

Overall, Mazu has a great start in developing a fast, efficient distributed DoS solution. Its approach to separate monitoring and defense mechanisms does not make Inspector an optimal solution on its own. If we have a tool that helps identify a distributed DoS attack, we'd also like that tool to at least recommend how to best defend against the current attack. We would probably wait until the Enforcer component becomes available (Mazu says Sept. 1) to provide a complete defense mechanism.

Analysis

Inspector examines packets on different metrics defined by the administrator and statistically determines whether an attack is occurring. These metrics can include, but are not limited to, packet size, source address, time to live (TTL) and payload.

For example, while attackers may spoof the source address on a packet, they cannot make changes to other aspects of the packet, such as payload. Inspector makes it difficult for an attacker to launch a surge of network traffic without introducing an anomaly that it is able to detect. This includes unusual variations or lack of variation in payload, port numbers, TTL and other metrics.

Inspector has two main components: the probe and the cluster head. Probes are individual sensors that can be distributed throughout a network to capture and analyze traffic. (They support up to eight Gigabit Ethernet links.) The cluster head is the master probe, or central reporting device. All probes report to the cluster head, which combines the data for a more thorough analysis and "big picture" of the network.

Within an Inspector probe, three main components are at work: user-level Mazu module, Mazu Kernel module and Mazu device driver. The user-level module is the brains of the product. It performs the packet analysis looking for anomalies that could be distributed DoS attacks. The Kernel module is optimized for rapid packet classification and routing to keep any latency introduced by its presence to an absolute minimum. The device driver optimizes packet processing, enabling Inspector to quickly and efficiently capture packets off the network.

Initially, Inspector baselines typical network activity (which takes about 30 minutes), documenting what is "normal" for the particular environment. It learns and adapts over time to the unique patterns of the network and is better able to separate legitimate increases in traffic from spoofed traffic with malicious intent.

To help avoid false positives, Inspector includes user-defined thresholds on up to eight aspects of the network traffic, including protocol levels and traffic flow, to trigger alerts at the first signs of possible distributed DoS attacks.

During testing, we launched a variety of distributed DoS attacks, and Inspector successfully identified each. We also created a sudden increase in legitimate network traffic to see if the Inspector could differentiate between legitimate and attack traffic, which it did. The attack information and characterization displayed in the Web-based reporting were accurate and informative. Based on our lab testing, Inspector is effective at analyzing network traffic and determining when distributed DoS attacks are occurring.

Administration and reporting

Inspector administration is performed either through the secure HTTP Web interface or directly on the console through Secure Shell. An embedded firewall developed by Mazu and based on the same packet-processing platform used for the Inspector distributed DoS analysis on the device limits access to these secure protocols. These administration tools provide four main functions: configuration, attack detection, attack characterization and traffic analysis monitoring.

Configuration settings allow you to enable SNMP monitoring and set system thresholds. With SNMP enabled, an alert can be sent via your network management system (which can then send e-mails or a page) when a distributed DoS attack is identified.

When Inspector determines an attack is under way, it alerts the administrator, either through SNMP or a message on the Web interface overview page. Then, it enters attack characterization mode. Attack characterization mode provides detailed information and analysis of a possible distributed DoS attack. Initial information is seen on the overview page during the attack.

The attack incident report page provides detailed information on attack histories and lets you drill down to specific packet details for

NetResults

TrafficMaster Inspector Version 4.0

RATING: 3.9 **COMPANY:** Mazu Networks, (617) 354-9292, www.mazunetworks.com **COST:** Starting at $100,000. **PROS:** Fast and efficient monitoring; accurate attack recognition. **CONS:** Expensive; no filtering recommendations.

	Analysis 35%	Administration 30%	Effectiveness 25%	Cost 10%	Total score
TrafficMaster Inspector	5	4	3	2	3.9

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score. Scoring key: 5: Exceptional showing** in this category. Defines the standard of excellence; **4: Very good showing.** Although there may be room for improvement, this product was much better than average; **3: Average showing** in this category. Product was neither especially good nor exceptionally bad; **2: Below average.** Lacked some features or lower performance than other products, or than was expected; **1: Considerably subpar,** or lacking features being reviewed.

each suspected attack.

Inspector lets you inspect your traffic from a high level down to individual packet contents. You can view a graph of all traffic and eliminate certain traffic types, such as all User Datagram Protocol (UDP) packets. You can also view traffic from specific IP addresses and time ranges. When under attack, this interesting view lets you see the differences in healthy traffic and attack traffic. The online reports are excellent and provide detailed information, but we would like to see some printable reports to present to management to summarize attacks, give an overview of what occurred and show other detail.

Conclusion

Inspector is an effective solution to identify distributed DoS attacks in large carrier-class networks. Starting at $100,000 for only monitoring and attack characterization, it is not a solution for the faint of heart.

Overall, TrafficMaster Inspector provides fast, efficient anomaly-based monitoring, but it does not provide any filtering recommendations. To do that, administrators must create their own filters based on the attack characterization information provided by Inspector or purchase Enforcer, which will implement filters in real time on a packet-by-packet basis.

Andress is president of ArcSec Technologies, a security consultancy. Her new book, Surviving Security, *was recently published. She can be reached at mandy@arcsec.com.*

How we did it

We set up a Gigabit Ethernet attack network with two servers, each a 900-MHz Pentium III with 128M bytes of RAM, as an attacker and a server. TrafficMaster Inspector sat in the middle of these two machines, monitoring and capturing all network traffic.

We launched a variety of distributed denial-of-service attacks using various tools and packet generators available at the Packetstorm Web site. Attacks included ping floods, ACK attacks, random ICMP floods, random IP floods and TCP reset floods. The ping flood attack sent a large number of Internet Control Messaging Protocol (ICMP) packets. The ACK attack sent a large number of TCP packets with the ACK flag set. The random ICMP floods sent a large number of ICMP packets with various aspects, such as IP address and time to live, randomized. The random IP floods sent a large number of randomized packets, and the TCP reset floods sent a large number of TCP packets with the reset flag set. With each attack, approximately 50,000 to 60,000 packets per second were sent across the network.

We also used a traffic generator (Traffic Source available at http://sourceforge.net/projects/traffic/) to generate several hundred megabits of traffic to simulate a sudden increase in legitimate traffic to see if Inspector flagged it as suspicious. This traffic included HTTP, FTP, SMTP and general broadcast traffic.

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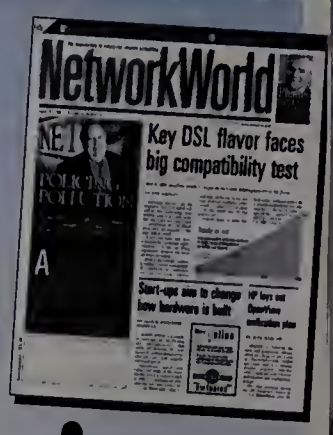


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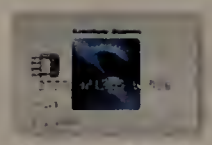
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Management Strategies

Career Development, Project Management, Business Justification

Controlling project creep

Workforce management software helps IT track costs, projects and staffing requirements.

BY NICK WREDEN

IT expenditures for plumbing wholesaler Ferguson Enterprises in Newport News, Va., represent one of the largest budget items, and senior executives wanted to know specifics about how the $30 million was being spent.

At the same time, rapid growth had overtaken IT management's ability to answer that question. Resources were applied across numerous projects, and it was difficult to capture a complete picture of who in IT was doing what — and why.

As a result, Ferguson turned to workforce management (WFM) software. These emerging applications automate human capital management. They help assign the right workers to projects, improve hiring and outsourcing decisions, and help retain workers through skills management and performance review. Companies are also using WFM as a planning tool to identify skills gaps and get workers training. "WFM takes human resource capabilities deeper. It involves looking for workers inside and outside the company, managing these workers as they grow, and understanding the available skills so that you can have predictive matching on future projects," says Andrew Goloboy, a research manager with IDC. "It's a kind of i2 supply-chain management for people."

Ferguson began installing its WFM application about a year ago. The goal: Better communicate to business executives the activities of the 200-person IT department and illustrate resource availability for future projects.

"Although everyone was working hard on ERP evaluation, legacy upgrades and other projects, these projects really weren't well-monitored and lacked sufficient coordination," says Mitch Cummins, an IT manager at Ferguson. "We wanted to an enterprisewide view of IT activities, both for executive and IT management."

Ferguson's $250,000 WFM system consists of Primavera TeamPlay, a Web application running on Windows NT that accesses an Oracle 8.1 database.

Ferguson is using its WFM system to manage a six-month network infrastructural upgrade at the firm's more than 500 sites. Since much of the site survey, router replacement and other work is repetitive at each location, TeamPlay can automatically manage scheduling, costing and resource management. Branch managers and other personnel publish the information weekly to the Web for access. "Instead of tracking routine activities, we can respond more quickly to exceptions, which is helping us keep a complex project on track," Cummins says.

While some companies emphasize project tracking, others are using WFM to monitor current and future skills requirements. Avery Cloud, vice president and CIO at Integris Health, a $1.1 billion healthcare provider in Oklahoma City, Okla., had three goals for the WFM system.

First, it had to help to align business goals and IT capabilities. It also had to provide skills management and tracking, which Integris uses in conjunction with training to minimize outsourcing and employee turnover. Finally, the workforce management system had to improve IT project management and provide more accurate costing.

"WFM helps us keep the ship on course," Cloud says. "Intelligent WFM improves the quality and throughput of IT projects for less money."

Implementation started with a skills inventory. Employees not only listed education and skills training, but also hobbies and other outside activities. The WFM application helped discover that one employee had been an artist, making that person ideally qualified for Web site design. It also helped target an outsourcing agreement when hospital physicians requested a Palm-based application that displayed current patient information. Employees had the necessary Visual Basic and forms experience, so all that was needed was consulting assistance with the Palm operating system.

Integris chose Changepoint WFM software, which runs on Windows NT in conjunction with a SQL database. The firm spent $150,000 on the software and hardware. What's more, four employees spent about 70% of their time over roughly two years customizing the application, entering data and developing new reports. The most requested report? Overdue projects.

Benefits have been substantial. For Ferguson, more projects are being completed on time. Staff morale is better since workloads are distributed more evenly. And business executives are getting the IT resource allocation information they demanded.

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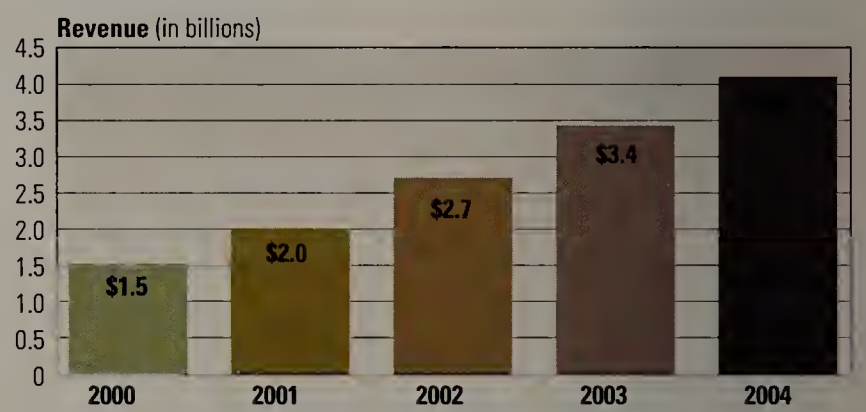
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Capital management

The workforce management market is taking off, more than doubling over a four-year span.



SOURCE: IDC

Integris now has an IT turnover rate of less than 10%, compared with a typical turnover rate of about 18% in other not-for-profit organizations. Because it costs between $60,000 to $110,000 to replace an employee, the boost in retention represents substantial savings. IT has minimized outsourcing costs, simplified performance reviews, and can more easily determine employee workload and on-time output.

IT also used the WFM system to identify about five employees who are vital to the long-range goals of becoming a Web-centric, PDA-based organization. "We're constantly sending them to classes, and will make them as happy as is legal to protect them from outside recruitment or defection," Cloud says.

Integris had to educate its employees about the benefits of the WFM system and convince them to use it. WFM applications typically require employees to track their time by day or even by hour. Resistance sometimes occurs from employees without experience in such time-sheet accountability. Integris employees also raised their eyebrows at being asked about personal activities for a corporate database. As a result, "no workforce management system is going to work well unless there is trust between employees and management," Cloud says.

Although Ferguson extensively briefed IT employees on the need and benefits of the WFM system, Cummins now says more could have been done.

Cloud predicts that the current skills crunch will become even more critical over the next five years. "Without a workforce management system in place, companies will find it more difficult to achieve short-term objectives and, more important, their visionary goals," he says.

Wreden is a freelance writer in Atlanta. He can be reached at nick@aspen1.com.

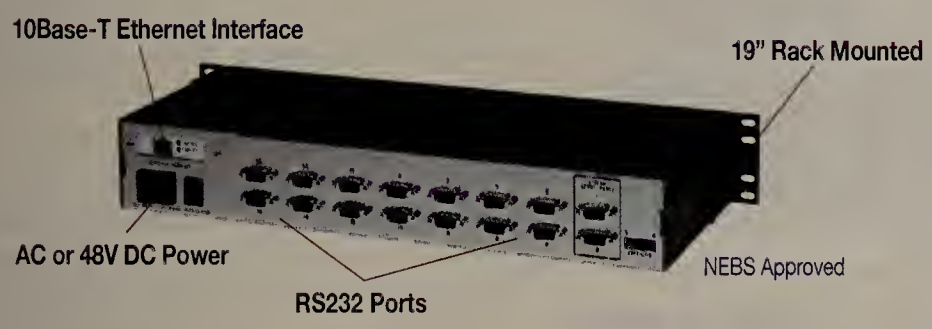
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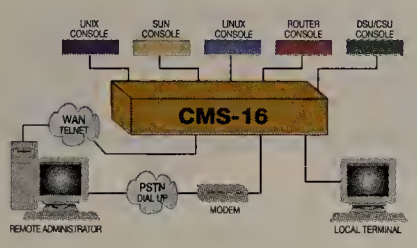
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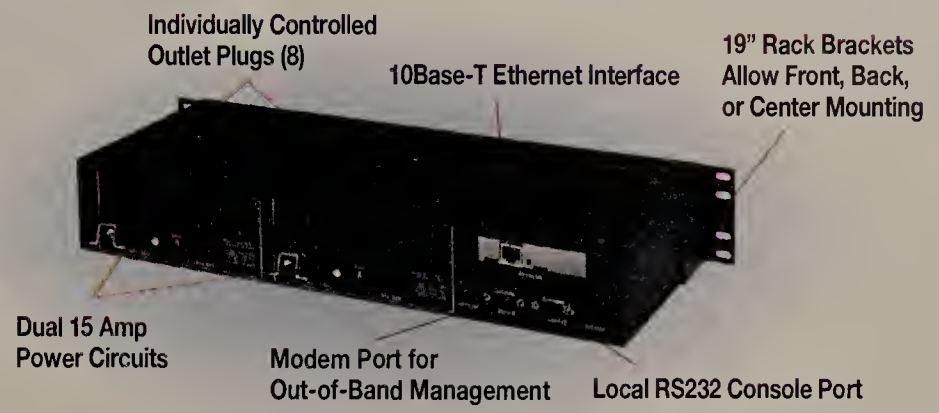
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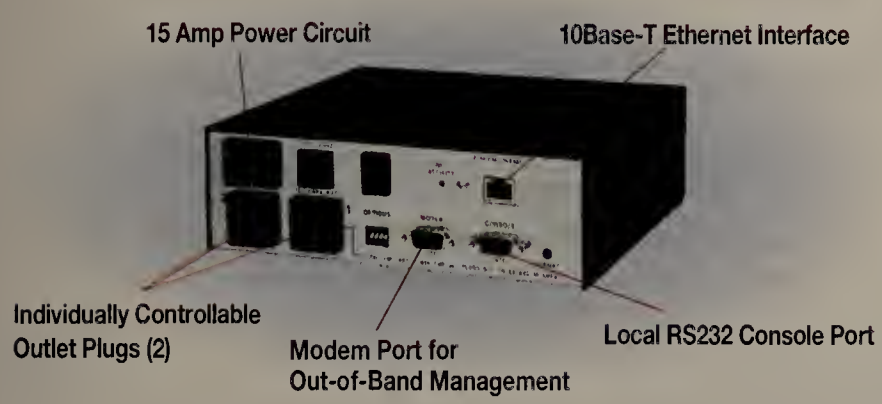


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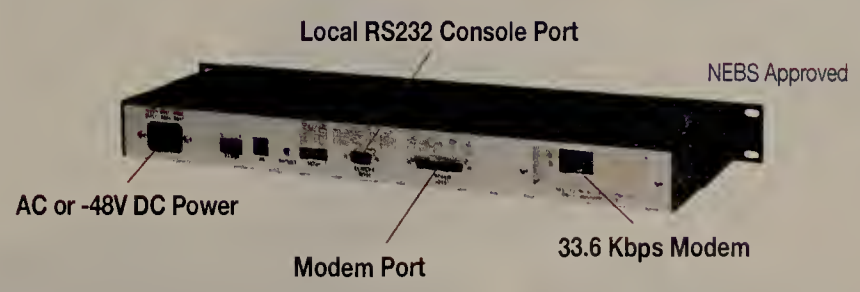


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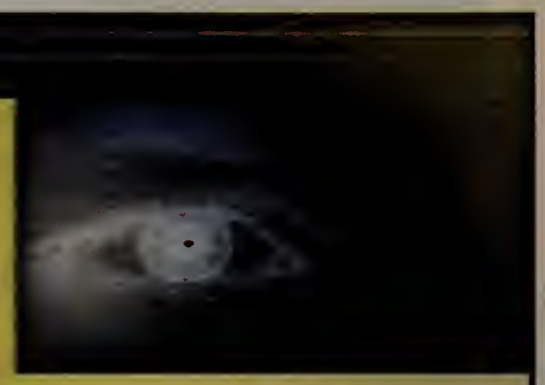
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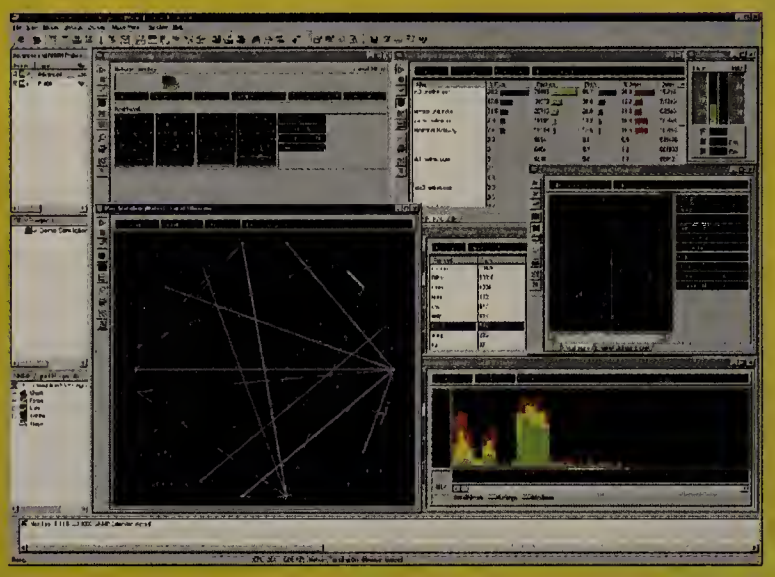
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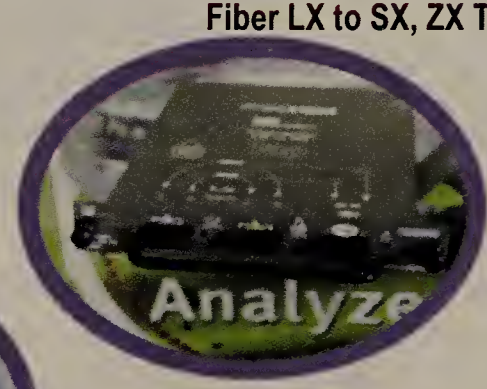
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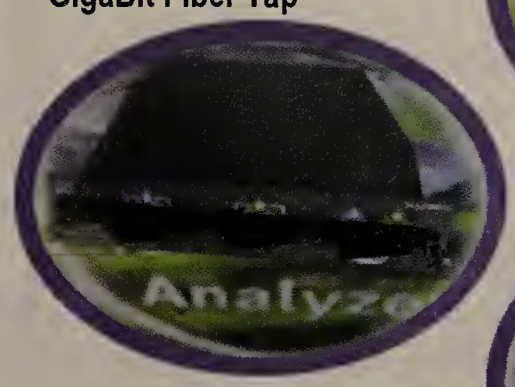
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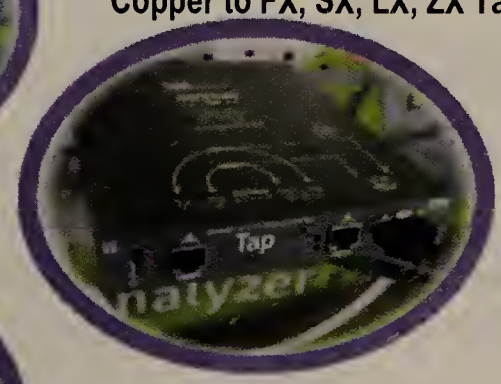
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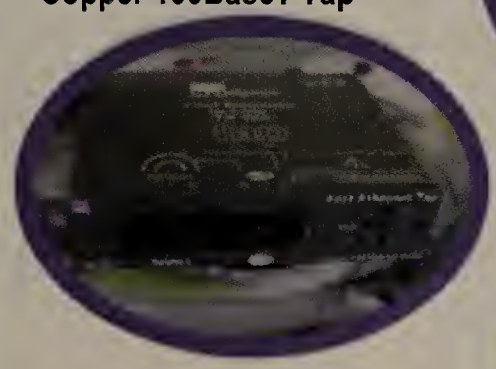
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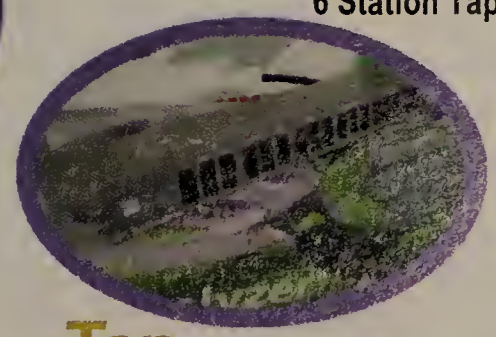
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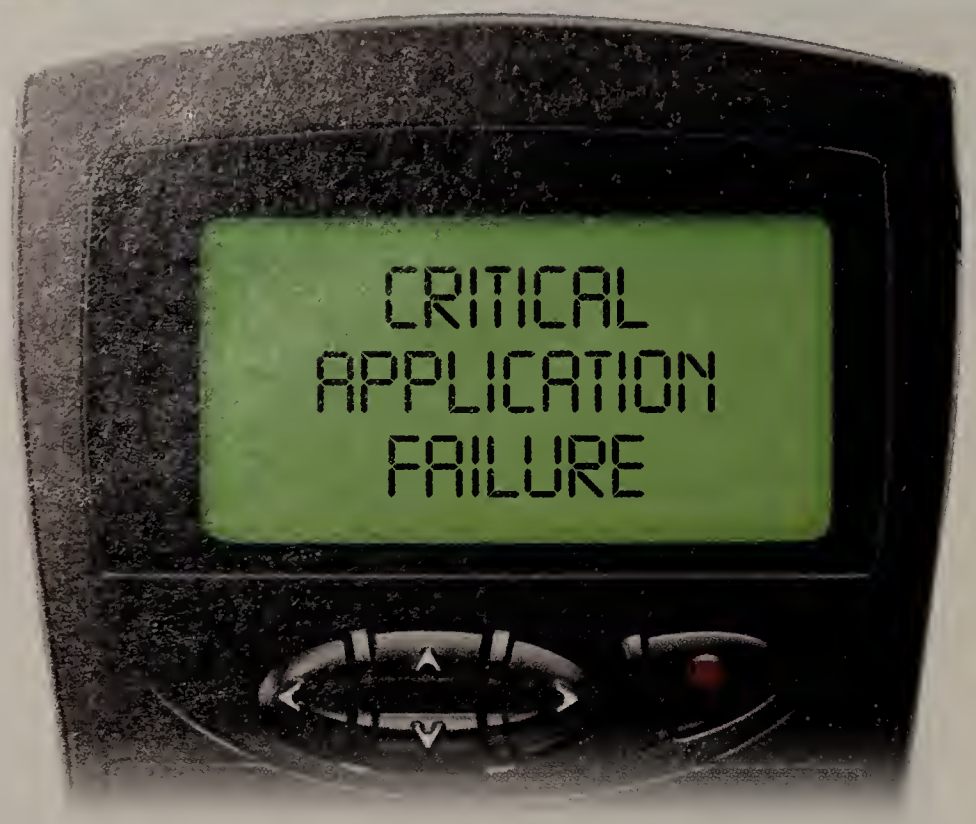
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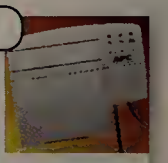


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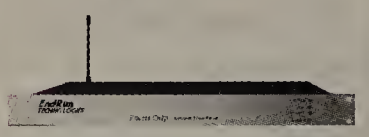
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Project Managers wanted by software consulting co. to manage a team of software professionals to design/develop custom-made software aplns; interact w/users/technical staff to analyze system reqmts; perform project mgmt duties to meet deadlines/budget constraints; use project mgmt tools incl. MS Office, MS Project; use development languages incl. C, C++, VB. Use RDBMS systems inc. Qracle, SQL Server; configure/install apln servers incl. Websphere, Weblogic and iPlanet; use UML design methodologies i.e. Booch, Raumbaugh, Rational Rose; use operating systems incl. Linux, Unix, Windows NT. Must have Bach, in Comp. Eng., Comp. Sci., or equiv. + 2 yrs exp. Respond to E-Zing Technologies, Inc., 41-43 Beekman St., 3rd Fl, NY, NY 10038; fax (212) 233-9862, hr@e-zingtech.com

Data Base Administrator needed to design, logical & physical data bases (SQL) for Commodities Trading & Clearing Company in NYC; 35hrs/wk; BS deg in Computer Engrg, MIS or Math & 4 yrs exp in job. Send resumes to Pioneer Futures, Inc., Attn: Mark B. Gonzalez, One North End Av St# 1251, NY, NY 10282.

Software Developers needed to analyze, dsgn, dvlp systems & applics using Java, HTML; provide db dsgn & admin for e-commerce applics. Apply to R. Gorga, Sengen, 1000 Briggs Rd, Mt. Laurel, NJ 08054.

STAFF CONSULT./ SAP INFO. ANALYST (MULT. OPENINGS)

Applyg. know. of SAP prgmg. techs. & computer sys., plan, dvlp., test, implement, & document comp. prgms. Eval. users' rqsts. for new or modified prgms. Make site visits as needed to gather info. & analyze sys. rqmts. Consult w/users to identify oper. procedures, clarify prgm. objectives, & leverage the functionality of SAP software to address critical rqmts. Apply know. of industry best-practices while configuring the SAP software & dsgng. enhancements to optimize processes. Utilize all components of the SAP dvlpmt. envmt. to combine pre-dvlpd. software objects w/ customized prgmg. to generate appls. that are highly integrated w/the SAP R/3 sys. Oversee install. of hardware & software. Train & provide tech. support to users of SAP prgm. Monitor performance of sys. after install. Master's degree in Comp. Sci., Bus. or Engrg. rqd. (Bachelor's degree in one of the above-enumerated fields plus 5 yrs. of prog. resp. work exp. in the position offrd. or as a Sys. Analyst or Software Engr. will be accepted in lieu of a Master's degree). Must know SAP/R3 prgmg. language. 40 hrs/wk, 8 am – 5 pm., QT as rqd. $90,000/yr. Qualified applicants report/submit resume to: Fayette County Team PA CareerLink, ATTN: JS Supervisor, 32 Iowa St., Uniontown, PA 15401-3513. Refer to Job Qrder No. WEB193834.

Curl Corporation, an Internet infrastructure products developer of next generation Web applications, is looking for a candidate to fill the position of Software Engineer.

If you are interested, please send your resume to Janet Carlson, Manager Human Resources, Curl Corporation, 400 Technology Square, 8th Floor, Cambridge, MA 02139.

ePresence Web Consulting, Inc., has multiple openings for its offices in New Jersey for experienced Software Engineers, Programmer Analysts and Web Developers skilled in: Oracle, Sybase, C++, Java, VB, HTML/DHTML, IIS, ASP, MTS, web/wireless technologies, etc. BS/MS required with 2 yrs experience. Highly competitive salary, travel/relocation required. Send resumes to ATTN: HR, 12 Broad Street, Suite 5, Red Bank, NJ 07701

F/T Sr. Programmer: Resp. for creating, customizing & designing software & object module components, object designs & flowchart systems according to specific design specifications or user's needs; using Qracle Reports & Forms inc. Order Entry Forms using Server-side stored procedures, & migrate Qracle 7.x to 8.x & Oracle Developer 2000 to 6.0; test, debug & maintain programs & code instructions working w/PL/SQL & SQL*Plus. Update, repair, modify & expand existing programs. Must have Bachelors degree in CS, Computer Engineering or related field. Foreign degree equiv. accepted. Must have 3 yrs. exp. in job offered or position w/ same duties. Send resume to Kathleen V. Spencer, AFLAC, at 1932 Wynnton Rd., Columbus, GA 31999.

SOFTWARE ENGR. (MULTIPLE OPENINGS)
Analyze, dsgn., dvlp., test & code commercial applications. Analyze, eval. & modify existing or proposed software systems. Coord. w/user to ensure timely & efficient delivery. Analyze software rqmts. to determine feasibility of design w/in time & cost constraints. Consult w/other engrs. to eval. interface btwn. hardware & software, & operational & performance rqmts. of overall system. Formulate & dsgn. software system using scientific analysis & mathematical models to predict & measure outcome of consequences & dsgn. Dvlp. & direct software system testing procedures, programming & documentation. Master's degree in Com. Sci., Engrg., Bus., Math or Physics plus one year experience in position offered or as Software Engr., Programmer Analyst, Systems Analyst or Software Consultant rqd. (Bachelor's degree in one of the above-enumerated fields plus five years of prog. rsp. exper. in the position offrd. or as a Software Engr., Programmer Analyst, Systems Analyst or Software Consultant will be accepted in lieu of a Master's degree.) Must have working knowl. of Qracle RDBMS; Visual Basic or Java languages. High mobility preferred. 40 hrs/wk, 8 a.m. – 5 p.m., $70,000/yr. Qualified applicants report/submit resume to: Manager, Beaver County Team PA CareerLink, 2103 Ninth Avenue, Beaver Falls, PA 15010-3957. Refer to Job Qrder No. WEB191881.

Database Analyst (Multiple Positions) wanted in Houston, TX. Apply to: HR Dept., Jewelry Kingdom, 7500 Bellaire Blvd. #618, Houston, TX 77036.

Consultants/IT Professionals needed for Germantown, TN based company. Cook Systems International, Inc has several senior and mid-level positions available for qualified candidates possessing MS/BS or equivalent and/or relevant work experience. Work with some of the following: Rational Rose, EJB, UML, and Java. Send confidential resume to: Cook Systems International, Inc., Attn: Heather Lasher, 6799 Great Oaks Blvd, Atrium II Suite 200, Germantown, TN 38138. Visit our website at www.cooksys.com

Responsible for managing multiple hardware and relational databases for the computer systems of corporate human resources (CHR) division. Administers operation of multiple client-server systems and databases in the creation of corporate human resources standards and procedures relating to human resources (HR) software. Consults on database design, maintenance, enhancements, expansion of logical design and physical database as per corporate requirements in HR applications/ business systems. Programs customized data loads, utilities and queries. Develops, implements and supports database's reviews. Validates and enhances logical database designs and defines and implements physical database. Performs capacity planning for various systems and databases. Performs database performance monitoring, tuning, backup and recovery operations. Installs/upgrades Oracle RDBMS and related products. Utilizes knowledge of a broad range of database client-server technology (including Oracle RDBMS, SOL, PL/SOL, SOL Loader, SOL Net, TCP/IP, LAN and NT/Unix operating systems) as well as human resources applications/ business systems. Applicants must possess a Bachelor's degree in Computer Science and five years experience in Oracle RDBMS, system design and analysis with client-server technology, three years experience in Oracle database administration, performance tuning, backup/recover, Oracle utilities and capacity planning, and two years experience in Human Resources applications/business systems and five years experience in the job offered or as a Database Administrator, Programmer or Engineer. 40 hrs per week (7:45 A.M. to 4:25 P.M.). $78,000.00 per year. Job located in Abbott Park, Illinois Applicants must show proof of legal authority to work in the U.S. Send resumes to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, Illinois 60605. Attention: Brenda Kelly. Reference # V-IL 24613 - K. AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME AND COVER LETTER. All resumes will be noted and forwarded to the employer for consideration.

Manufacturing comp. in Aurora, IL. Req. Software Eng. with M/S deg. & 1 yr. exp. or equivl., w/foll; AS/400, PRG/400, CL/400, RPG/400, SOL, ACCESS. Des., dev, maintain, software progs. Interface, code & test programs. Write reports, formulate software. Send res., Dept. GC, Sunbeam Health & Safety Prod. 3901 Liberty St. Road, Aurora, IL 60504.

Software Developer wanted by Int'l Mktg Research Co in TX. Oversee design applications, write flowcharts & program descriptions; collect & analyze data. MS in Comp Sci & 1 yr exp in job offered req. Respond to: HR Director/Millward Brown, 1250 Capital of TX Highway, Bldg 1, Ste 600, Austin, TX 78746.

Software Engineer (St. Louis, MO): design, develop and maintain Internet/Intranet applications utilizing C/C++, Java, JSP, Visual Basic, SOL, Oracle, ASP, XML and Coldfusion; evaluate systems effectiveness, recommend improvements, and troubleshoot problems in programming and other project specifications. Requires MS in Comp. Sci. or CIS plus min. 6 mo. exp. Competitive salary; 40hr/wk; Mon.-Fri., 8:00am-5:00pm. Resume to Marti Stubblefield, HR Dept., Hellmuth Obata & Kassabaum, Inc. 211 N. Broadway, Suite 600, St. Louis, MO 63102. No phone call/EOE

Web Developer needed by a Design/Communication Company in North Chicago, IL. Must have a Bachelor's Degree in Computer Science, Mathematics, with 6 months experience in database design and development. Respond to: VP, Strategic Accts., Studio North, Inc., 1616 Green Bay Road, North Chicago, IL 60064.

Management & Systems Consulting Advertisement

Permanent opening for Project Manager - SAP Specialist in Chicago, IL to: Conduct initial business analysis of company operations to identify areas of cost reduction and system optimization through the implementation of the R/3 Network Software System; define a company-wide project plan for the implementation of the system; manage and direct overall network system and system configuration in areas of accounting, manufacturing, sales and human resources; manage, direct and supervise programmers in implementing the system; manage and direct project budgeting, financing and pricing. Must have Master's degree in Communications Science, Business Administration or related field as well as two years of experience as a Systems Analyst - SAP Specialist. Send resume to: Management & Systems Consulting Inc., 70 West Madison, Three First National Plaza,. Suite 1400, Chicago, IL 60202.

2 Senior Consultants for San Fran office. Positions involve design & dev't of web-based e-business applications for our clients incl. testing, data model & DB Design. Involves project management working w/OO methods, MVS & UNIX, Versata, data warehouse, Java. Must have BS Degree, 5 yrs. relevant exp. incl. project management exp. Send res. to Shared Vision Group, 168 Madison Ave. 6th Fl. NY, NY 10016 corporate@sharedvision.com

Software Engineer (multiple positions, St. Louis, MO) design/ analyze/maintain Object Oriented software applications in Windows NT/2000 environment utilizing Java, CORBA, GUI, XML, HTML, ODBC. Require BS degree in Comp. Sci., Elect. Engr, MIS or in a closely related field plus min. 2 yrs. exp. in offered position or as systems/programmer analyst. Competitive salary. Resume to: Ken Totten, Object Computing, Inc., 12140 Woodcrest Executive Dr. Suite 250, St. Louis, MO 63141. EOE

Database Analyst (Kansas City, MO) to assist in the design and enhancement of medium-to-large scale database structures in both main frame and client-server environment, applying RDBM tech., C, UNIX, Oracle, PL/SOL, and VMS. Requires B.S. in Comp. Sci., Elec. Engr., MIS or in a closely related field plus min. 1yr. exp. Competitive salary, 40hr./wk; Mon.-Fri., 7am-4pm. Resume to: Ms. Binkley, HR, Commerce Bank, 825 Main St., Kansas City, MO 64105. No phone call/EOE

COMMUNICATIONS TECHNOLOGIST needed, to be responsible for interfacing between IT engineers and large end users in system design for server based local area and wide area networks, including optical networks, providing technical education. Requires minimum 2 years experience. Submit resume to Michael Mellinger, HR, Belden Wire & Cable, 2200 US Highway 27 South, Richmond, IN 47374. EOE.

Systems Analyst. Analyze, design, and develop new computer systems and application programs to meet customer needs; develop and implement conversion plans; prepare and process models; direct and review the work of development team members; and assign team members to projects. Must have Bachelor's degree in Computer Science, Engineering or related, plus one year experience and knowledge of EJB, Threads, Swing, Java 2, HTML, TCP/IP, UNIX and Oracle/ SOL. 40 hrs/wk. $100,000/year. Must have proof of legal authority to work in the United States. APAC CUSTOMER SERVICES, INC, Attn: Cindy Corkery, 6 Parkway North Center, Deerfield, IL 60015. Toll free # (800) 776-2722. EOC./AA

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E-Commerce/Web Support Assistant to develop and maintain the websites; coordinate soft installations; design GUI screen and graphics; administer and monitor users accessing the systems; provide training and assistance to customers on in-house computer systems; operate Data Security System. B.S. in business administration or computer fields and one year of web support experience that include Network, Seagull Jwalk developer, AS/400, Window NT, Java Script, ASP, HTML, SOL, Clarion Language, Web Tool and Animation Tool. 40hrs/wk, 8am-5pm, M-F. Job is in St. Louis, MO. Send resume to Automated Installment System Co. 955 Executive PKWY, Suite 201, St. Louis, MO 63141 (Attn: Carol Manson) with proof of legal authority permanently to work in U.S.

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SYNAPSE GROUP, INC., a leading computerized magazine marketing company, is looking to hire qualified candidates with, at minimum, a Bachelors degree in Computer Science, Information Systems or it's equivalent for the following positions:
WEB DEVELOPER to design, develop and create internet application systems that can handle order entry, database, data retrieval, report generation and document management, using HTML, SQL and ASP for requesting clients. Maintain existing systems and add enhancement features. Two years of experience in the job offered required with sound knowledge in Java, JavaScript, HTML, SQL, ASP, Front Page, Sun Solaris, Window 95/NT, Access and Oracle database.
COMPUTER PROGRAMMER to plan, develop, test, document and update computer programs, evaluate user requirements, prepare flow charts and diagrams and convert project specifications. Two plus years of software development experience required with knowledge in Java, Java Script, HTML, Unix, Telnet, XSLT, COBOL, Windows NT, Web Development, Access and Oracle database.
ASP DEVELOPER to implement Internet applications for order entry, data retrieval, report generation and document management using ASP, HTML and SQL programs to implement new systems into several multifunctional tiers that handle data processing and database, and to maintain and add enhancement features to existing systems. Two years experience in the job offered required with extensive knowledge in ASP/ADO, VBScript, IIS, SQL, Oracle RDBMS, Unix, Java, HTML, and WWW and related protocols.
E-COMMERCE DEVELOPER to develop and design e-commerce applications. Design, develop and create Internet application systems that can handle order entry, database, data retrieval, report generation and document management, while maintaining and adding enhancement features to existing systems. At minimum, Bachelors degree in noted fields above or in Business Administration or it's equivalent required plus two years of experience in the job offered with extensive knowledge in ASP/ADO, VBScript, IIS, SQL, Oracle RDBMS, Unix, Java, HTML, and WWW and related protocols.
The company offers a competitive compensation/benefit package and an environment where achievements are recognized & professional growth is encouraged. Qualified applicants are encouraged to mail resumes to: HR Department, Synapse Group, Inc., Four High Ridge Park, Stamford, CT 06905-1325.



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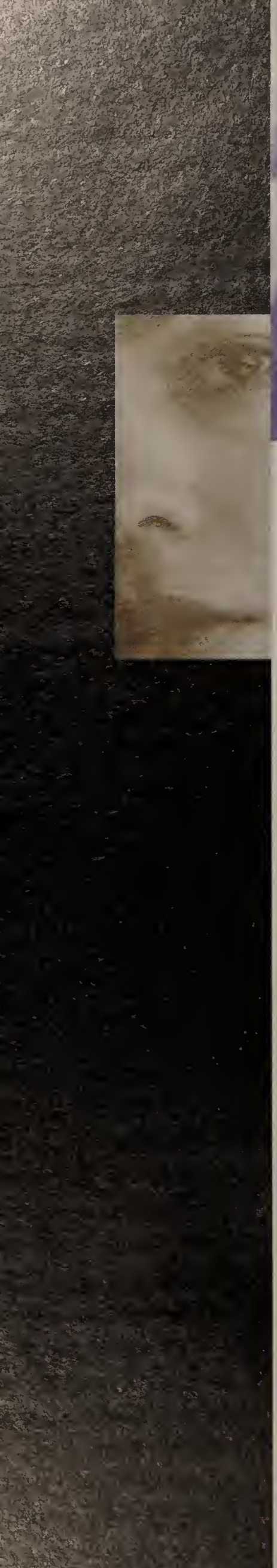
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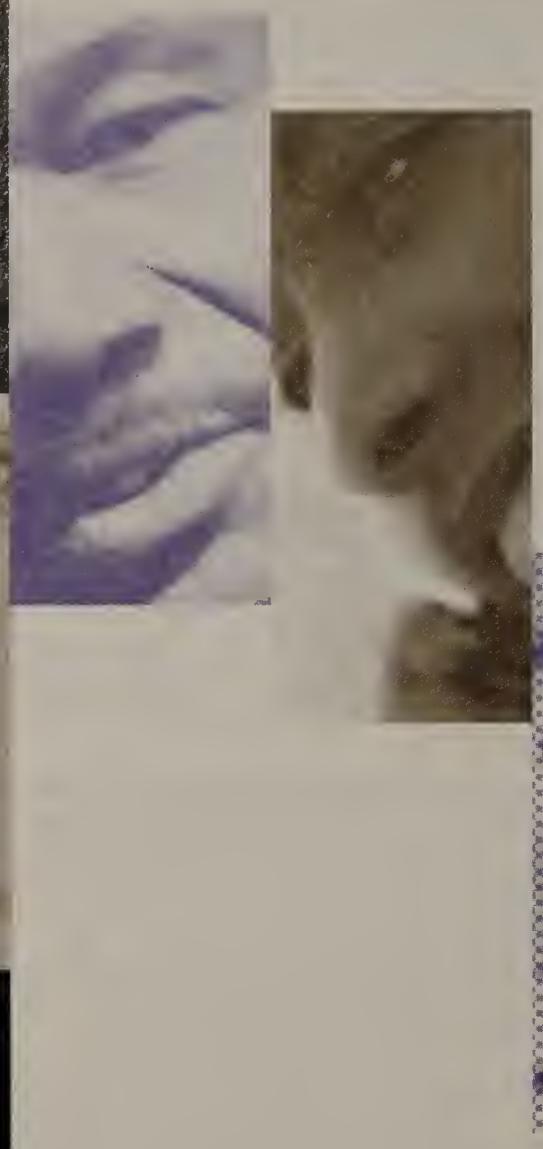
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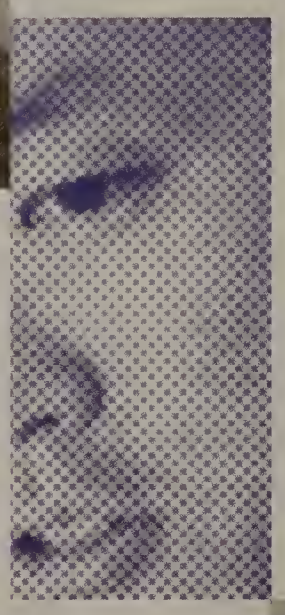
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Please direct all inquiries and send resume and cover letter, no later than 9/7/01, to Glenn Hartzoge, Bldg. 36, Rm. 5A07, 36 Convent Drive, MSC 4152, Bethesda, MD 20892-4152, (301)496-5468, FAX (301)496-4276, or e-mail gh25@nih.gov.
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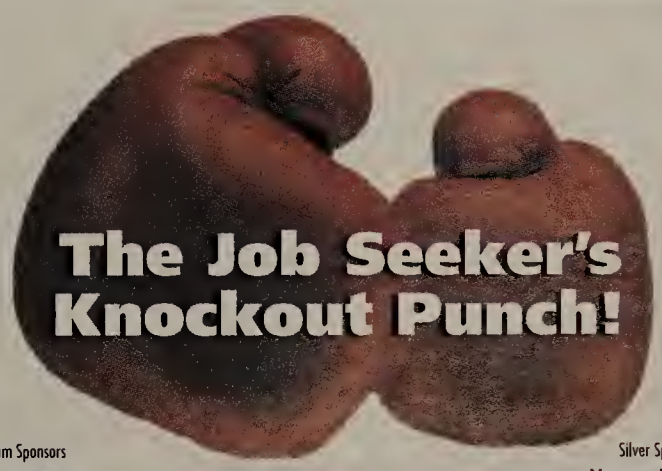
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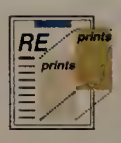
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Bruce Townsend, special agent in charge for the Secret Service's financial crimes division. Supervisory Special Agent Jim Hegarty of the FBI's computer crime squad says it is currently investigating four such cases in New England alone.

"Eighty percent of the cases we're seeing are from the inside or people who were formerly with the organization," Townsend says. "When you conduct an investigation, that's one of the first areas you need to look at now.... It's not if you're going to be attacked, but when you're going to be attacked."

Kenneth vanWyk, CTO for ParaProtect Services, a security portal in Centreville, Va., says 95% of the break-ins they're called in to handle are insider-based.

"An insider attack really gets the attention of the company because an insider has access to all the critical systems," vanWyk says. "If they want to do damage, they know how.... A company's decision to protect itself isn't just a technology decision. It's a business decision."

Grocer victimized

In the Miami case, Herbert Pierre-Louis, a hardware engineer who worked in the IS department at Purity Wholesale Grocers, is being charged with computer sabotage for the June 18, 1998, incident at the $1.5 billion national grocery outlet based in Boca Raton, Fla. Assistant U.S. Attorney Richard Boscovich says the damage was well over the $5,000 waterline that is one of the key factors making this a federal crime.

Boscovich will not release information until the trial gets under way on how the crime allegedly was perpetrated or why Pierre-Louis would want to attack his own employer.

The FBI's Hegarty says this is a time when companies should be particularly cautious.

"In light of the economy and the downturn and layoffs, companies should pay attention to this," he says. "These are not isolated events. There's an awful lot of trust they have in computer people in these companies."

That's a lesson Omega Engineering's Bridgeport, N.J., manufacturing plant learned the hard way. In the summer of 1996, a software time bomb went off in the plant's computer network, systematically eradicating all the programs that ran the company's manufacturing operations. Exacerbating the problem, Omega's only back-up tape was missing. The manufacturing plant was no longer able to manufacture. Company executives, during last year's trial in U.S. District Court in Newark, N.J., said the company had yet to fully recover. The incident caused $12 million in damages and led to Omega losing its footing in the high-tech instrument and measurement market and the eventual layoff of 80 employees.

Omega's former network administrator, Tim Lloyd of Wilmington, Del., was charged with sabotaging the network he helped build. He was found guilty after a four-week trial. The judge later set that verdict aside after a juror told the court she was unsure whether a piece of information she had heard on television news had been factored into her verdict.

The government appealed the judge's ruling, taking its case in front of the Third Circuit Court of Appeals in Philadelphia this past April. A ruling is pending.

Lloyd was charged under a relatively new statute that made computer sabotage a federal offense if it affected a computer used in interstate commerce and caused more than $5,000 worth of damage to the company over a 12-month span. That was the first federal criminal prosecution of computer sabotage.

Similar cases prosecuted

Now that same statute is being used in three other cases.

One of those cases charges network consultant Christopher Sandusky with sabotaging the computer network at one of his clients, Steinberg Diagnostic Medical Imaging in Las Vegas. Sandusky is charged with three counts of network intrusion for changing passwords in the network, which locked administrators out of their own system. Assistant U.S. Attorney Matthew Parrella notes in the indictment that Sandusky allegedly hacked the system on three different days between late February and early March of this year.

Sandusky, working with a partner, had been hired as a subcontractor by the medical imaging company, according to sources close to the investigation. Both the deal and the partnership fell through, and Sandusky's partner went to work for Steinberg Diagnostic as a system administrator. The government contends that Sandusky attacked the system to gain revenge.

The damage had to have added up to at least $5,000 for Sandusky to be charged with a federal offense. Further information won't be released until the trial, which is slated to start Oct. 15 in U.S. District Court in Las Vegas.

Earlier this summer, a former help desk worker at Bricsnet, a Portsmouth, N.H., application service provider for the construction and design industry, was found guilty on federal charges of network sabotage for hacking into Bricsnet's system after being fired last fall. Patrick

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Protect your company

A slumping economy means more layoffs and disgruntled employees. And that means network and security administrators need to protect their companies more than ever. Here are some steps to take when laying off an employee, especially an IS worker:

- After terminating an employee, do not give him any access to his desk, his PC, his laptop or any company-owned handheld devices.
- Immediately terminate his e-mail account, password and logon name.
- Change everyone's password in the company at the same time so they can't be used to break back into the system.
- Change passcodes for physical locks in the building, especially those for the computer rooms.
- Conduct a new backup immediately.
- Verify that your back-up tapes are where they should be and are functioning properly.
- Starting on the day of the termination, lock down every system to which the worker had access.
- Go up on the system and check user names and passwords, looking for anything unusual.
- Strengthen your intrusion detection system.
- Set a trip wire — software that alerts the administrator to system anomalies, such as the size of a file changing.

GHOST ACCOUNTS: AN OPEN DOOR TO NETWORK SABOTAGE

It's a scary indicator of a spiraling economy that through the first six months of this year nearly 1.1 million workers were laid off, according to the U.S Department of Labor.

Even scarier is the question of how many of those workers still have active accounts on the networks of their former employers.

So-called ghost accounts, those not closed when workers leave, can include access to mainframes, databases, file servers, intranets and e-mail. There are also remote access holes with VPN passwords and dial-in accounts. All open "back doors" into a network.

A recent series of high-profile network sabotage cases show that vengeful employees can wreak high-tech havoc.

"Disgruntled employees are a significant threat," says Larry Rogers, senior member of the technical staff at Computer Emergency Response Team Coordination Center. Security experts recommend a combination of procedures, policies and automation to combat the threat.

"We have an application that notifies all departments when an employee leaves, puts the user's passwords in a deny-access mode and quarantines their files," says one network administrator for a global distribution company who requested anonymity. "Part of the process is manual, and we are evaluating ways to automate that."

Automation is key and is being made available in a class of products known as provisioning software, which can automatically activate and deactivate user accounts.

"If you are a CIO and are currently using a manual process, fundamentally you have no way to know the process [of deprovisioning] worked. With provisioning software that is the opposite. You know that the process was completed," says Mike Neuenschwander, an analyst with The Burton Group.

Just last week Access360, Novell and Waveset Technologies announced provisioning products. Business Layers also has a product called eProvision Day One.

Access 360 released Version 4.0 of its EnRole provisioning software, which is now integrated with corporate directories to centralize user account information. Novell released its Employee Provisioning System, which is intended to create a single user identity across a corporate network. Waveset Technologies is offering for free its Inactive Account Scanner, which ferrets out dormant accounts.

However, the process must include social engineering, Rogers says. That means teaching employees not to share passwords and administrators not to reactivate closed accounts.

Rogers recalls one case where a former Coast Guard employee was able to hack into a database using a password given to her by an unsuspecting co-worker.

The result: A bill of $40,000 and 1,800 staff hours to repair the damage.

— John Fontana

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McKenna of Hampton, N.H., pleaded guilty to breaking into the system twice using a supervisor's password — once the night he was fired and again the next morning — to delete a total of 675 files, change user access levels and send e-mails to Bricsnet clients saying the company's project center would be temporarily or permanently shut down.

The attack, which was discovered by another Bricsnet employee the next day, cost the company $13,614 in in-house repair costs, according to Arnold Huftalen, Assistant U.S. Attorney for the District of New Hampshire. Some of the destroyed files could not be restored.

"His activities were meant to cause as much damage as possible. It was malicious," says the FBI's Hegarty, who says putting a financial number on the loss is misleading. "How do you quantify the impact when customers receive these kind of damaging e-mails? You can't put a dollar on that. Would a company pay $13,000 not to have that happen?"

William Tucker, vice president of Bricsnet, says administrators took basic security precautions after firing McKenna, who had broken company rules against moonlighting and other activities. Tucker says they terminated McKenna's password, logon and user accounts. They also changed the code on their building's keypad and escorted McKenna from the building.

"There was no sense of foreboding," Tucker says. "These steps were routine for us. . . . Certainly, we had an extensive [security] system in place but we were always thinking of outside intrusion."

Tucker says the incident, which the FBI traced back to McKenna in less than a week, has changed the way the company evaluates its security needs. Since the attack, Bricsnet has re-evaluated its security system and limited network access.

"We're acutely aware of the damage a disgruntled employee can cause," he says. "I think people took it personally. For someone you've worked with on a daily basis, it certainly was an element of betrayal." ◪

Network crime spree

The annual Computer Crime and Security Survey, jointly done by the FBI and the Computer Security Institute, shows network break-ins are increasing.



40% of respondents reported outside system break-ins. That number is up from 20% in 1997.

64% acknowledged financial losses due to computer breaches.

85% reported security breaches within the last 12 months.

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Love,
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1. An ounce of kindness

As they say, an ounce of kindness will get you a pound of love. Dave, a corporate communications director at an IT storage company, says his employer's "crack IT staff" is incredibly responsive. "More importantly, they're even nice about the IT problems I cause," he says.

2. Going the extra mile

Sometimes it's the little things that count most, like taking that extra step to help a user. Amy, an editor in Needham, Mass., who works from home part-time, says her IT staff helped her configure her home computer for DSL. "I saved money because I didn't have to pay for someone to come in and install it," she says.

3. Lots of smarts

Evan, a communications professional from New Jersey, appreciates the know-how of his company's IT team. He says skill levels are improving as the IT department becomes more familiar with Internet technology. "The depth of knowledge has increased exponentially, and the response time when problems arise is much better. IT issues seem to be resolved on the first visit, or with the first phone call," he says.

4. Grace under pressure

Many corporate IT departments are servicing companies whose business is IT. That puts pressure on the internal IT folks to perform. Dave, director of marketing at an IT services firm, puts it this way: "When your company has hundreds of customers depending on you to deliver their IT infrastructure, your internal IT department is held up to very high standards. It's like being a doctor whose patients are other doctors. I have great respect for our IT folks, especially given what our company does."

5. Quick on the uptake

While some users complain about slow response time, there are many others who praise IT for their speed in resolving problems. Neal, corporate development manager at an application service provider, says his firm's IT staff takes its cue from the company's customer support center.

"Since they receive notice of the exact issue from the . . . service center [instead of from me directly], they are able to come right in and fix the problem, instead of the trial-and-error process usually necessary to identify the issue," he says.

Lisa, a colleague, adds: "When problems arise with e-mail or any application, I call the . . . service center. They either walk me through the steps to fix it myself or someone is at my desk in minutes. . . . The whole process is quick and painless, and I get on with my day."

6. Cutting edge

Users give IT a nod for installing devices and network equipment that makes their work easier. One user, for example, crowed that all employees have laptops and docking stations that can be hooked up anywhere in the building.

7. Knight in shining armor

When a computer crashes, end users don't care what caused it. They just want their files back. That's where IT comes in to save the day.

Laura, a communications director at an application service provider, recalls losing her entire electronic Rolodex of media contacts. "They were able to walk me through retrieving it using some cool tool called Previo. Previo automatically backs up your hard drive so there's no forgetting at the end of the week, day, etc. Very smart — and it saves the IT department and me, the end user, from hours of sorting through files and backups."

8. Knowledge sharing

End users praise IT for taking the time to explain how to fix a problem so that the next time it occurs the user can fix it himself. That's a plus for the end user and IT, since it saves time and trouble on both ends. As one user says, "Now that they educated me on how to restore items, I can do it myself." ◪

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edly were abusing the CTMP system.

"Some channel partners were using the program to gain an unfair discount advantage over those partners who set preference for Cisco solutions," says Tom Mitchell, senior vice president of Worldwide Channels at Cisco. "This is not consistent with our current channel strategy to focus on value-added service instead of price."

Some Cisco customers, who received the Justice e-mail last week, scrambled to purchase what Cisco products they could before the predetermined discounts were scrapped.

"We have been informed that the trade-in program is ending," says Raymond Santana, network engineer at the University of California, Davis, Medical Center in Sacramento. "It means we will have to accelerate our purchases to take advantage of the trade-in."

Justice's e-mail also said Cisco will no longer collect or retrieve competitive equipment that's replaced with Cisco gear.

"Rather than focus on the logistics of collection and destruction of our competitors' legacy products, we will apply these efforts into other competitive sales programs and into further enhancing the Cisco value proposition," Justice wrote.

One reseller corroborated Cisco's claim that the program was being abused by the channel.

"I heard there were many abuses of this program and that it cost Cisco a lot of money to verify receipt of the 'Vendor X' equipment and to eventually dispose of it," says Joe Wenker, a principal engineer at Qwest Communications. "It also seems to make sense to not [give customers incentives] to replace gear from vendors that are no longer in business . . . say 3Com. I believe Cisco will still be aggressive on price when in competitive situations, but it may cost them less to just discount their equipment rather than discount and then collect other vendors' equipment."

CTMP was created three years ago to accelerate adoption of Cisco products by companies and service providers. ◪

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Backspin

PC ignorance — a big mistake



MARK GIBBS

sides in last week's column (see www.nwfusion.com, DocFinder: 5733) have generated a lot of e-mail.

"In New Zealand, we're comfortable calling this decade the 'noughties' just as we had the eighties and the nineties before it." — reader Geoff Pooch from — guess where? — New Zealand.

"And while we are on the subject, it really annoys me that everyone says 'two thousand and one.' Surely if we are consistent with the last century, it's 'twenty-oh-one.' I will continue my personal crusade on this one." — reader David Lowe who, curiously, is also from New Zealand.

This shows that it is all a question of interpretation. Whether you want to say the "aughties" or the "noughties" or "two thousand and one" instead of "twenty-oh-one," the final say will be whatever becomes the accepted standard — the cultural norm — at least where the naming of things is concerned. And until we're a little further into this decade, we won't know what the norm will be....

The other, rather more meaty issue that arose out of the column was outlined by Saro Marcarian: "Your points regarding security are valid. Your points regarding poorly coded viruses are valid. You did, however, miss a great opportunity to alienate a bunch of people with the truth on why the current crop of poorly written viruses are so successful."

Saro, you are so right — I did miss an opportunity to alienate, infuriate and offend a bunch of people. So here goes: The truth of why the current crop of poorly written viruses are so successful is simple — most users are working on autopilot. They use their computers as if they didn't have to think about what they are doing so they open attachments and run programs without any thought of consequences. This is, of course, a big mistake.

Their blind faith in computers is a fine example of how the computer industry, aided and abetted by Hollywood and mainstream journalism, has let the myth of the "electronic brain" characterize the PC just as much as it characterized the mainframe.

The curious thing is that the average person knows full well that PCs can't be trusted and won't help them to do their work beyond some arbitrary and variable point that depends on what applications they have installed, what they have done with their computers in the last 24 hours and which way the wind is blowing. Even so, the old adage "you can lead a horse to water but you can't make it drink" applies.

The majority of people simply won't learn about PCs and will be hugely offended when their PCs don't behave as they expect. How often has your mother, father or spouse complained bitterly that yet again there is something wrong with their computer and how often have you, after hours of discussion and interrogation, discovered that they have the shift lock or scroll lock on (even though at the beginning of the conversation they vehemently denied it)?

The problem is that there's no vocabulary that can efficiently and easily enable naive users to articulate their problems with computer hardware and software when they need to. While we might ascribe this lack of words to profound ignorance on the end user's part (equivalent to trying to drive a car without understanding what role gasoline, turning indicators and air in the tires play), the real fault lies with PC operating systems that, at best, are focused on the user having a "good time" (in other words, lotsa chrome and features) but offer little help that goes beyond the absolute basics.

The fact is that the great unwashed — your users, colleagues, clients, co-workers, spouse and family (unless they are in the computer business) — are, in the main, totally untrainable when it comes to PCs. Until the industry produces a better mousetrap, or at least, a better user interface and more user-friendly services, PC ignorance can only grow deeper.

Show you're smart by writing to nwcolumn@gibbs.com.

'NET BUZZ



The latest on the Internet industry



PAUL MCNAMARA

As online merchants learn from the dot-com postmortems and apply those lessons to improve their e-commerce sites, do you find yourself buying more stuff — and more expensive stuff — over the Internet?

Me neither.

Extrapolating a trend based on limited personal experience is always risky, but it's tough to ignore the impression that online shopping — more often than not — fails to beget online buying. Virtual window-shopping is what we're talking about, and the practice cannot be good news for companies that rely solely on online sales for survival.

On the other hand, e-window-shopping may be an underestimated asset for companies with a presence in both the physical and virtual worlds, according to new research from **Jupiter Media Metrix**.

Jupiter maintains that offline purchases influenced by online research will constitute almost two-thirds of the benefits that a traditional merchant derives from its Web site. Accounting for this fact will boost such a site's return on investment by 65%, the researchers contend.

Whether those figures hold up in the real world is anyone's guess, but the general description of an online shopper/offline buyer fit this particular consumer as he recently went about the unpleasant task of purchasing a minivan.

Mrs. Buzz and I had determined early on that we wanted a Dodge Grand Caravan. The only unanswered question was who would win our business. Seeing as I write about the Internet for a living, it seemed obligatory that I at least try to get the deal done through the Web.

Let's just say the experience was less than satisfying.

One site promised to hook me up with a dealer in my area who could provide the specified vehicle and quote me a competitive price. In my area turned out to be 65 miles away . . . in a neighboring state.

Another site did a swell job of fielding my request for information and forwarding it to a nearby dealer who the site claimed would have the desired Dodge. The dealer immediately sent an e-mail confirming my inquiry.... And I never heard from them again.

A third site promised to convert 50,000 of my American Express Membership Rewards points into a $1,000 certificate that could be applied to the minivan purchase, but the fine print was far too complex for the average trade journalist to understand. And the site's request for a $300 deposit simply scared this potential buyer away.

Frustrated, I went to the official Dodge Web site — www.4adodge.com — found a list of dealers, dialed a round of old-fashioned phone calls, received a handful of verbal quotes, then dragged my butt down to the low bidder for hand-to-hand combat.

The dealer experience was still the dealer experience, but at least I had stopped spinning my wheels.

A Buzz reader who says my recent recommendation of **www.roadtospringfield.com** "nearly got me fired at work," offers this tip for those who believe the Internet can be an instrument of *good* deeds, as well as frivolous and evil ones:

"I'd like to let you in on a little company run by a friend of mine here in Homer, Alaska," **Ben Stuart** writes. "It's **www.generousadventures.com** and it is the only all-travel benefit auction on the Internet right now. It receives donated adventure and accommodation trips from around the world and puts them up to bid on the site. At the close of the auction the proceeds go to various environmental organizations such as Robert F. Kennedy's Waterkeeper Alliance, the Natural Resources Defense Council and the World Wildlife Fund."

Land a swell trip at a decent price while doing your bit for the environment?

Beats shopping for a minivan.

Comments, suggestions and "What I did on my summer vacation" essays should be sent to buzz@nww.com.

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